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Commemoration of the Fourth Centenary
OF THE
Discovery of America.

COLUMBIAN HISTORICAL EXPOSITION, MADRID.

CATALOGUE OF THE DISPLAY FROM THE DEPARTMENT OF
PREHISTORIC ANTHROPOLOGY, UNITED STATES
NATIONAL MUSEUM.

BY

THOMAS WILSON,
Curator.

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CATALOGUE OF THE DISPLAY FROM THE DEPARTMENT OF PREHISTORIC ANTHROPOLOGY, UNITED STATES NATIONAL MUSEUM.

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The Department of Prehistoric Anthropology of the National Museum was represented at the *Exposición Historico-Americana*, Madrid, 1892, by about 5,000 objects, selected from the department, and intended to present a synopsis of aboriginal industry. The objects were exposed in nineteen double slope-topped cases, which were distributed throughout the main hall assigned to the United States at the Exposition. The objects were classified, so far as possible, in such way as to show a series of implements and objects in each case or in each portion of a case. General labels descriptive of the series were printed in Spanish and distributed in their appropriate places. A description of the objects displayed, together with the names assigned them, the material used, the mode of manufacture and probable purpose, is attempted to be set forth in the following pages.

PALEOLITHIC AGE.

The first appearance of man on earth has been assigned in Europe to the Quaternary Geologic period; in the United States to the close of the Glacial Epoch, though this has been denied.

The Paleolithic implements are the first known works of man. They have been found over the world in the Quaternary deposits, associated many times with the remains of extinct animals belonging to that geologic period. The different epochs of human culture of the Paleolithic age have, in western and southern Europe, received the designations of Cave-bear, Mammoth, Reindeer, Bison epochs, after the animals which characterize them, and after the deposits, Alluvial and Cavern, and all after the localities, Chelleen, Moustierian, Solutrien, Madalenien epochs. They are periods represented in this display.

ALLUVIAL PERIOD.

CHELLEEN EPOCH.

Block of cemented sand and gravel from the Quaternary gravels of the river Marne at Chelles, east of Paris, in which Paleolithic implements have been found. Pieces of worked flint are to be seen in it, while other fragments from the loose sands beneath are by its side. This station has given its name to the earliest epoch of the Paleolithic age.

Seven Chelleen implements from the Quaternary gravels of southern England. Similar implements have been found on the surface. They are of the flint of the country, and have been chipped to their present shape. Many of them show signs of use. They are almond-shaped, thick in proportion to their width, and have the cutting edge at the point.

Four Chelleen implements from the Quaternary gravels of the river Somme at St. Acheul and Ameins, northern France; of flint, pointed, almond-shaped, crust of pebble left for grip, and with cutting edge at the small end. (Fig. 1.)

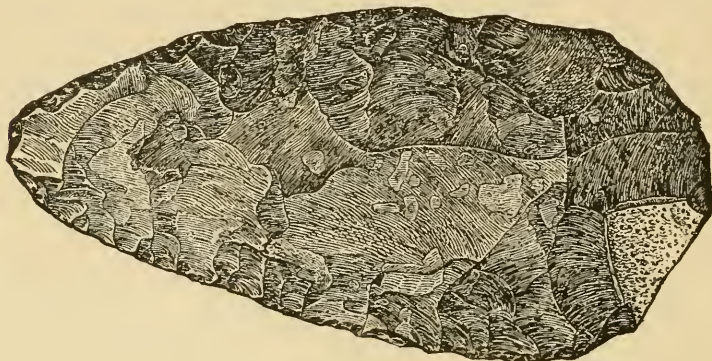


Fig. 1.

PALEOLITHIC IMPLEMENT OF FLINT.

Chelleen Epoch, Alluvial Period. St. Acheul, France.

Thirty Chelleen implements from different localities in northern, central, southern, and northwestern France. They are of flint and have the same general form as those mentioned from England.

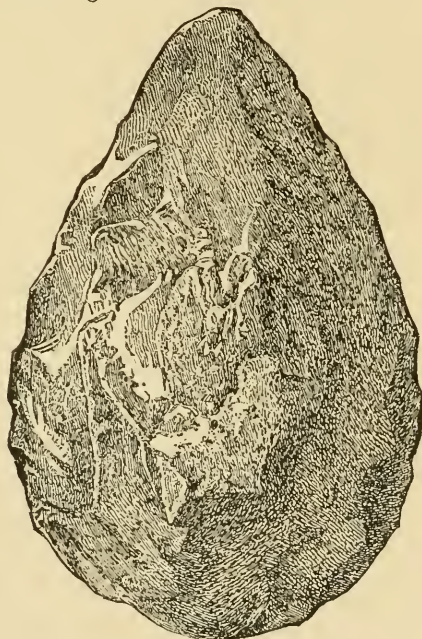


Fig. 2.

PALEOLITHIC IMPLEMENT (QUARTZITE.)

From near Madras, India.

Three Chelleen implements from central France, of the usual thick almond form. They are of flint, which, from weathering or exposure to the chalk bed, have become whitened. In the highlands of the interior these are sometimes found on or near the surface.

Two Chelleen implements from the gravels of the river Garonne, near Toulouse, made from quartzite boulders. They are rudely chipped, and thick, and the cutting edge is at the point as in other paleolithic implements. They resemble the specimens from Piney Branch, near Washington, D. C.

Two smaller Chelleen implements of quartzite, from the celebrated workshop of Bois-du-Rocher in Brittany. Discovered by MM. Micault and Fournier. These are more in the form of disks, chipped on both sides and to an edge all around.

Paleolithic implements have been found in isolated localities throughout northern Italy and in Spain and Portugal. These specimens are from Lake Garda in the Tyrol. (*See Cartailiac for locality.*)

Twenty Paleolithic implements of flint, which, with many others, were found in the foothills on the left border of the Nile, Egypt, by Prof. H. W. Haynes, of Boston. He received a bronze medal from the Association Française for his discovery.

Four Paleolithic implements from the Laterite beds near Madras, southwestern Hindostan, Asia. (Fig. 2.) Similar ones have been found near Nerbuddah, northwestern Hindostan. They are of quartzite, rudely made, but have the usual characteristics of thickness and the cutting edge at the smaller end. Also 3 specimens found near Yokohama, Japan, possibly Paleolithic.

CAVERN PERIOD.

Six specimens of quartzite chips and implements of human art work, from Cresswell Caves, Yorkshire, England, associated with remains of Mammoth, Rhinoceros, and other extinct animals. Collected by Prof. W. Boyd Dawkins, of Manchester, England.

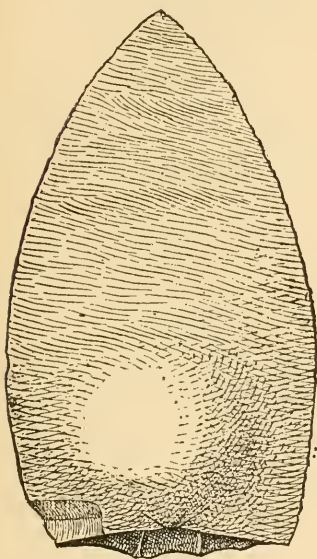


Fig. 3.

MOUSTIERIAN POINT, SPEAR OR OTHERWISE
(FLINT).

From Cavern of Le Moustier.

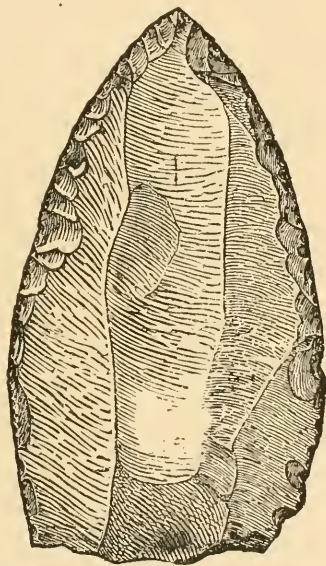


Fig. 4.

OPPOSITE VIEW OF FIG. 3.

Five specimens of red earth from lower stratum of Kents Cavern, Torquay, containing tooth of Cave-Bear, with a section of the overlying stalagmitic deposit. In this were found teeth of Elephant, Rhinoceros, and Hyena, associated with Chelleen implements. Collected by Mr. W. Pengelly, of Torquay, England.

MOUSTIERIAN EPOCH.

Seven Moustierian points from Cavern of Moustier, France (Figs. 3-4). Scrapers the same, with cutting edge on the side and not at the end (Figs. 5-6). Cave-bear tooth.

SOLUTRIEN EPOCH.

Twenty-five specimens of flint, 9 of bone, from Solutré, near Châlons-Sur-Saône, France. Horse bones abounded. Reindeer appear during this epoch. The chipped edge of flint scrapers is changed from the side to the end. Two kinds of flint points, presumably for weapons, are found; one small, rechipped only on the back, with stem and shoulder on one side, the other the leaf shaped, long, broad, and very thin, some are 16 inches wide and but three-eighths of an inch thick. This was an epoch of fine flint chipping.

MADALENIEN EPOCH.

Eighteen specimens of flint, 15 of bone. From the Rock-shelter of La Madeleine, on the Vézère, Dordogne, France. Flint chipping continued during this epoch; scrapers, knives, points, and flakes are found. Bone points, daggers, and harpoons were common. The man of this epoch was an artist. More than 400 specimens of engraving on bone, horn, ivory, and stone have been found in the Caverns of this period.

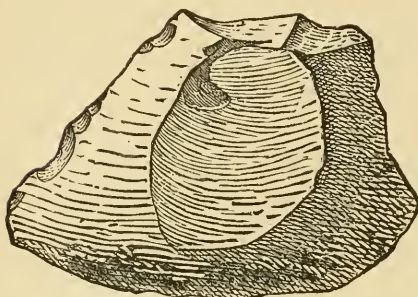


Fig. 5.
MOUSTIERIAN SCRAPER, SHOWING BULB OF PER-
CUSSION (FLINT).
From Chez Pouré.

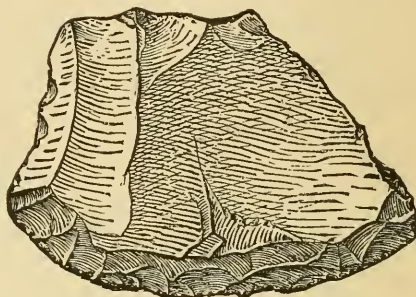


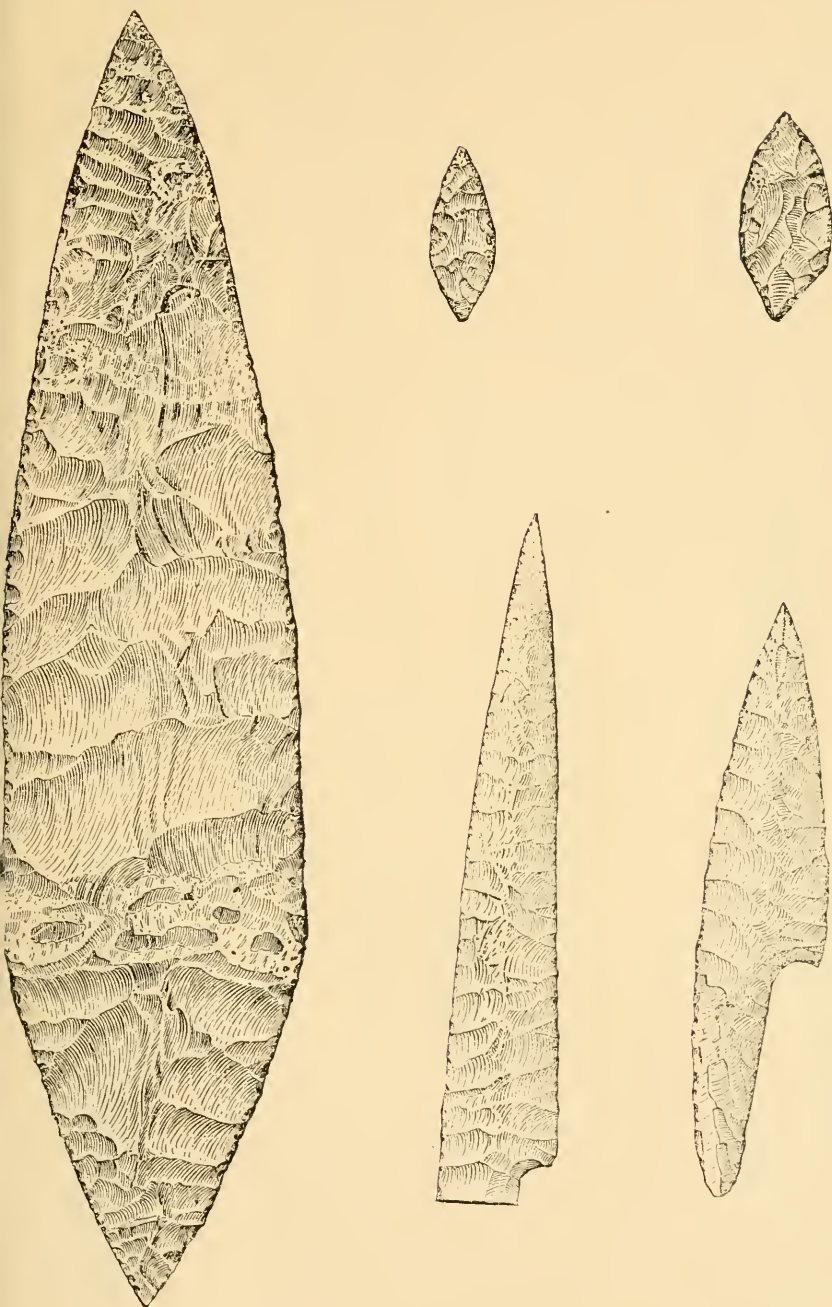
Fig. 6.
OPPOSITE SIDE FIG. 5.

EUROPEAN PREHISTORIC SKULLS OF THE PALEOLITHIC AGE.

Cast of the Neanderthal Skull. The original was found near Dusseldorf, Germany, and is now at the University of Bonn, discovered by Drs. Schaffhausen and Fuhlrott in 1857. Although the forehead is low and retreating, the skull is not small; its estimated capacity is 1,220 centimeters. Its cephalic index is 0.72. Many persons are of the opinion that it belongs to the Moustierian rather than the Chelleen Epoch. Its great antiquity has been disputed, but, nevertheless, Prehistoric anthropologists have given its name, possibly for want of a better, to the earliest known type of the human race.

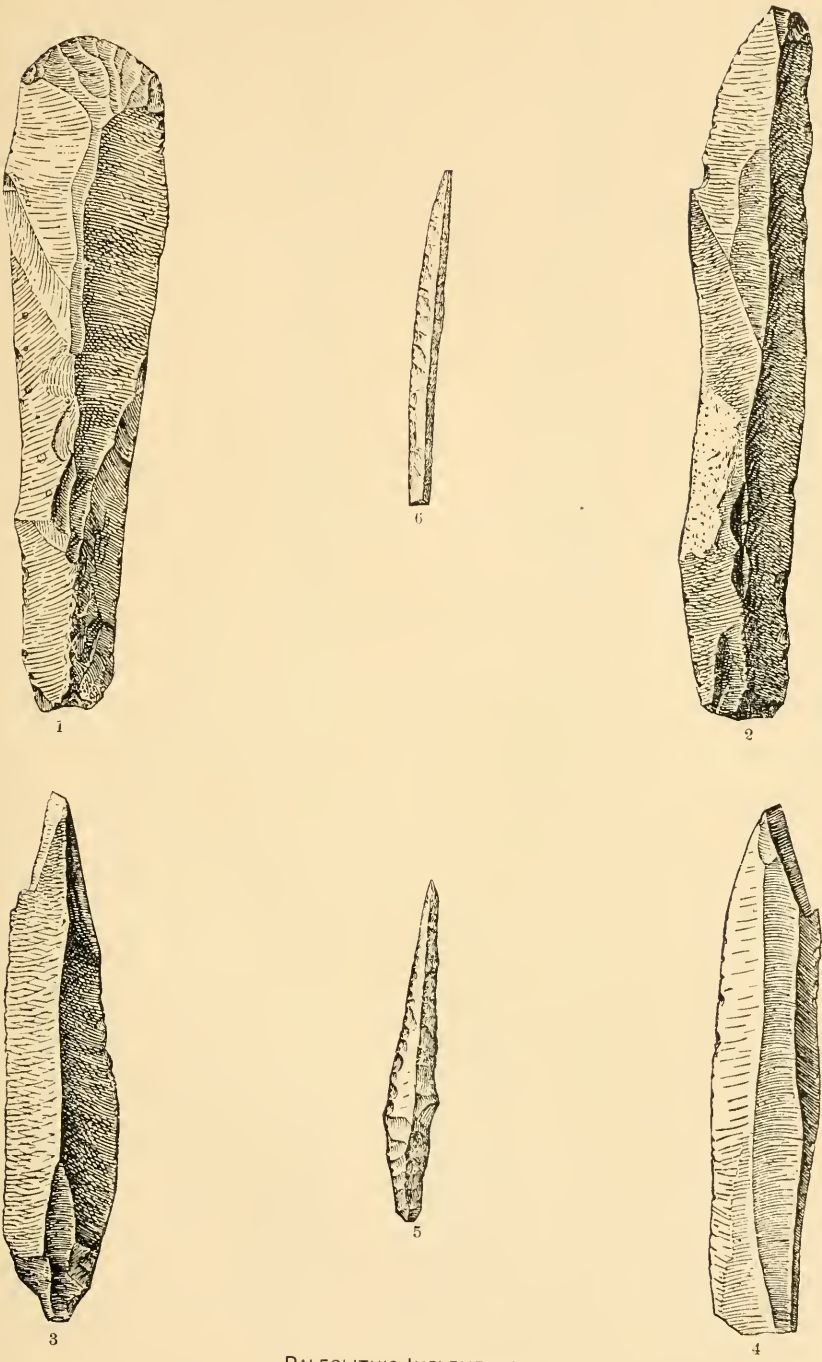
Cast of the Olmo Skull, from the celebrated paleontological deposit of the Val d'Arno, near Florence, Italy. It was found many feet beneath the surface associated with worked flints, horse teeth, and mammoth tusks, all of which, with the original skull, are in the Zoological Museum at Florence. The skull is claimed to have belonged to the Moustierian Epoch of the Paleolithic Age. It is too fragmentary to be measured.

Cast of Laugerie Basse Skull, found by M. Massenat, of Mailmont, near Brives (Correze), France, in 1872, while excavating the celebrated prehistoric caverns of Laugerie Basse on the Vézère, Dordogne, France. The skeleton was entire and in place. It was on its side, the legs drawn up, the hands placed on the side of the head and neck. It was considered that he had been killed under a detached and fallen rock. It is in the possession of M. Massenat. The Cavern belongs to the Madelenien epoch of the Paleolithic Age.



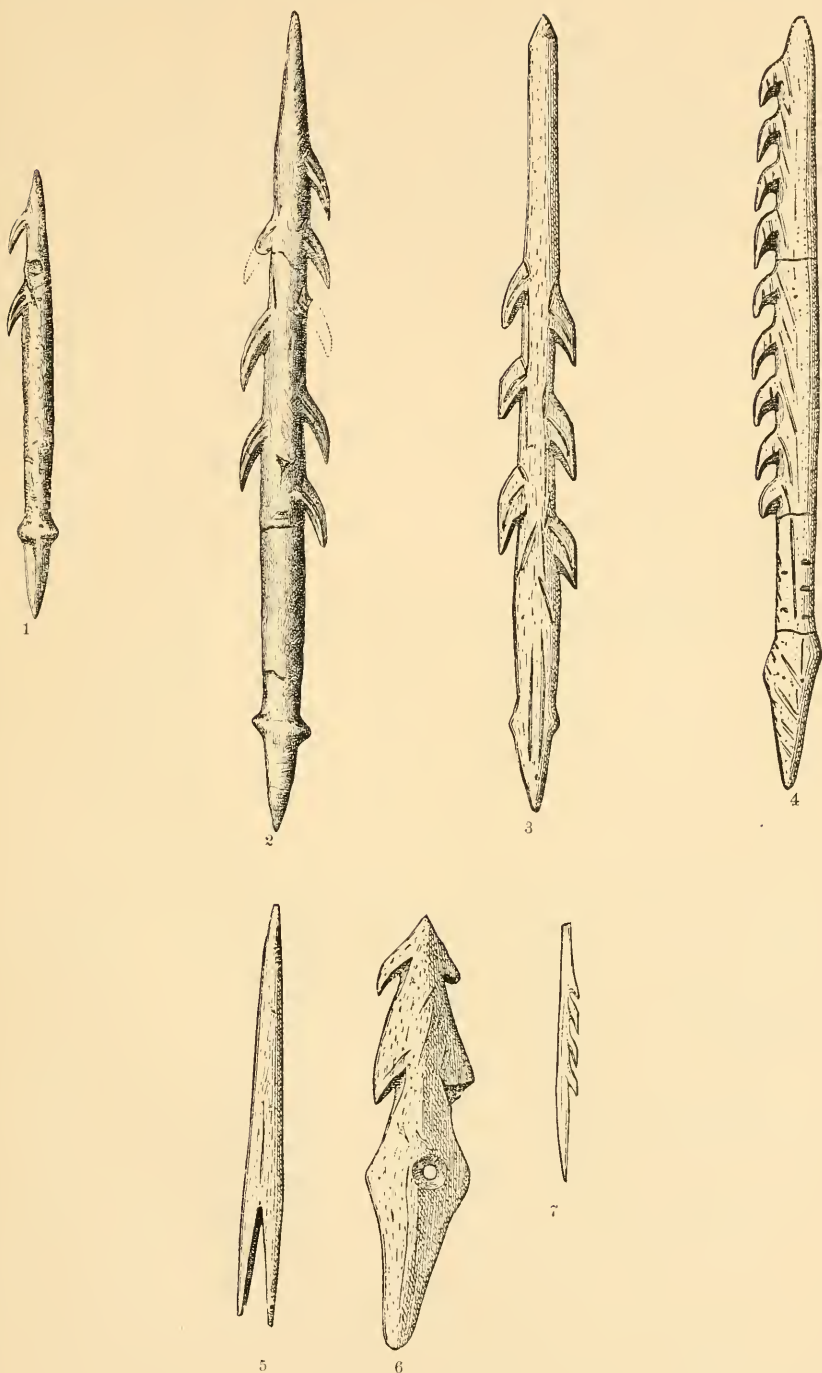
PALEOLITHIC IMPLEMENTS.

Points of the Solutrian epoch, leaf-shaped, and shouldered on one side. Cavern period.



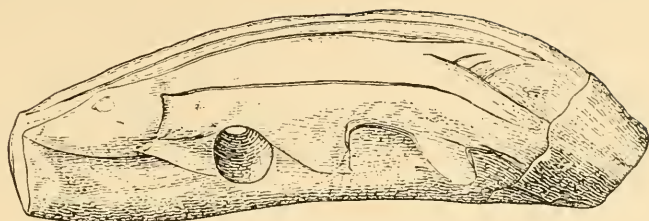
PALEOLITHIC IMPLEMENTS.

Fig. 1. Flint scraper, with rounded end. La Madeleine, Dordogne, France.
Fig. 2. Flint flake; probably a saw or knife. La Madeleine, Dordogne, France.
Figs. 3 and 4. Flint graters. La Madeleine, Dordogne, France.
Figs. 5 and 6. Flint points or drills.

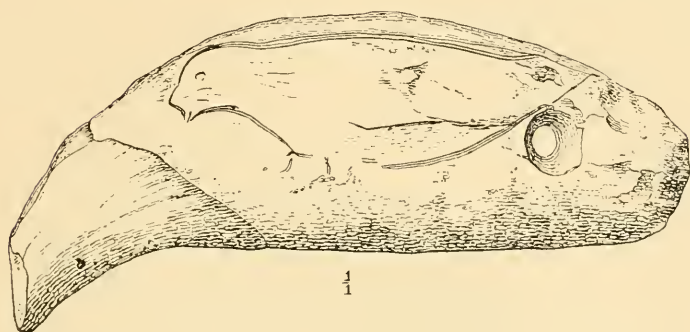


PALEOLITHIC IMPLEMENTS.

Figs. 1, 2, 3, and 4. Harpoons made of reindeer horn. La Madeleine, Dordogne, France.
Figs. 5, 6, and 7. Points and harpoons made of reindeer horn; hole and slit for attachment to shaft; southern France.



$\frac{1}{1}$
1



$\frac{1}{1}$
2



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PALEOLITHIC IMPLEMENTS.

- Fig. 1. Engraving of pike on canine tooth of bear. Grotto of Duruthy, southwestern France.
 Fig. 2. Engraving of seal on canine tooth of bear. Grotto of Duruthy, southwestern France.
 Fig. 3. Engravings of a man, horses, aurochs, and snake or eel on reindeer horn. La Madeleine, Dordogne, France.

Cast of the Engis Skull, discovered by Dr. Schmerling in the Cavern of Engis, near Liege, Belgium, in the year 1833. It was of this skull that Professor Huxley said that it might have belonged to a savage or a philosopher.

NEOLITHIC OR POLISHED STONE AGE.

The name Neolithic was given by Sir John Lubbock to the later stone age to distinguish it from the earlier, the Paleolithic or Chipped Stone Age. Many of the stone implements, after being chipped or pecked into shape, were smoothed or polished by grinding. Some, such as scrapers, arrow and spear heads, were always chipped and not polished. This period introduces a new civilization—that of a sedentary and agricultural people, with flocks and herds, plants, fruits, textiles, and pottery. Tribal organizations were formed, religious sentiments manifested, the dead buried, and funeral monuments erected.

Forty-four flint objects from workshops in Great Britain and Ireland, showing the mode of manufacture. Cores and flakes of black flint fitted together as in the original block, with knapping hammer, from modern gun-flint workshops at Brandon, Suffolk. (Fig. 7.) Prehistoric blades and flakes, scrapers, discs, hatchets, chisels, and poignards, polished and partly polished, from Cissbury, southern England, and from Ireland. Arrowheads of various forms.

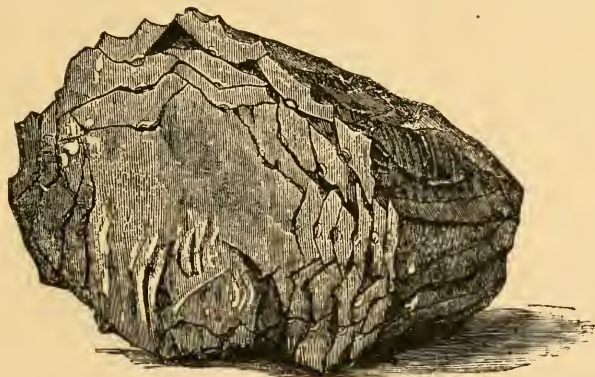


Fig. 7.

FLINT CORE, WITH ITS BLADES AS STRUCK, IN PLACE.

Brandon, England. Evans's Ancient Stone Implements of Great Britain.

Nineteen worked flint implements from the Prehistoric workshops of Grand Pressigny, near Tours, France. Large cores (*livres du beurre*), hammers, blades, flakes, daggers, and points. All of the yellow flint of Grand Pressigny.

Eighteen implements and objects from the Prehistoric flint quarries and workshops of Spiennes, Belgium. Unpolished hatchets, cores, blades, flakes, hammers, etc.

Thirty-three flint implements, many of them from Prehistoric workshops in Scandinavia. Cores, hammers, blades, flakes, scrapers, crescents, daggers, arrow and spear heads.

Sixty-two flint implements and objects from eastern and northern Italy. Small cores, flakes, scrapers, discs, points, and beautiful arrowheads.

Ten flint and obsidian cores and flakes. From Syria, 2 specimens; Island of Crete, 4 specimens; Island of Milo, 4 specimens.

Seventy-one flint flakes and points discovered by Mr. W. Flinders Petrie at Kahun in the Fayum, Lower Egypt, in 1889. Many of these show signs of use. They belong to the time of Amenhotep III, of the Twelfth Dynasty, about 2650 B. C., and are probably the earliest Prehistoric specimens to which an historical date can be given.

Seventeen obsidian cores and blades from Mexico and Central America (fig. 8). The blades are thin, sharp, and beautifully made. Large worked flakes, scrapers, arrow and spear heads of flint and obsidian.

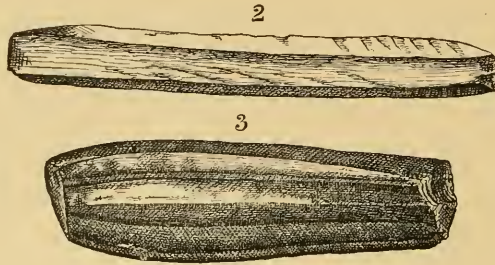


Fig. 8.

OBSIDIAN CORE AND FLAKES.

Mexico.

Twelve specimens of drilled axes from Europe. These are plentiful in the Swiss lakes and in Scandinavia. In Europe the drilled axes take the place of the American grooved axes. These specimens show different kinds of drilling, and different stages of progress. Some were drilled from one side, others from both. Some have been drilled with a hollow bit, and a number of entire cores thus made are shown. These implements belonged to the Neolithic period, but continued into the Iron Age.

Six chipped stone hatchets from Europe and Asia. These have been first chipped

into shape ready for grinding, and then polished. The series shows the process of manufacture. The first (fig. 9) is rudely and the second (fig. 10) finely chipped; the third (fig. 11) is partly and the fourth (fig. 12) entirely polished; the fifth (fig. 13) is rechipped to an edge and the sixth (fig. 14) reground.

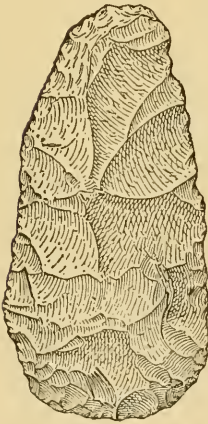


Fig. 9.



Fig. 10.

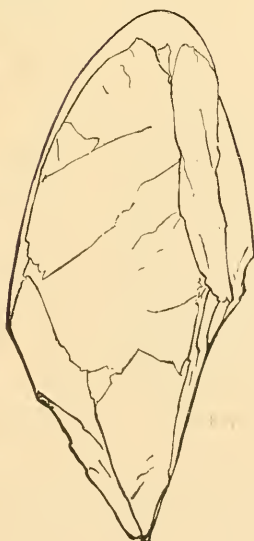
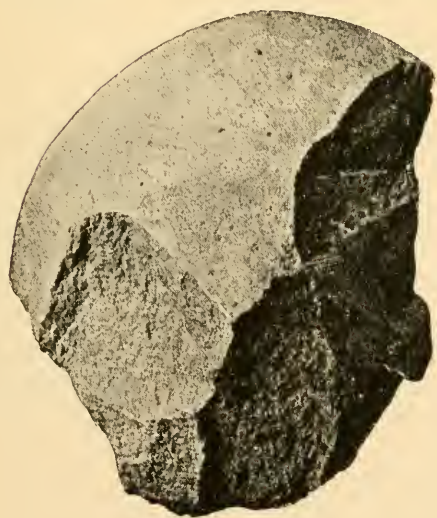
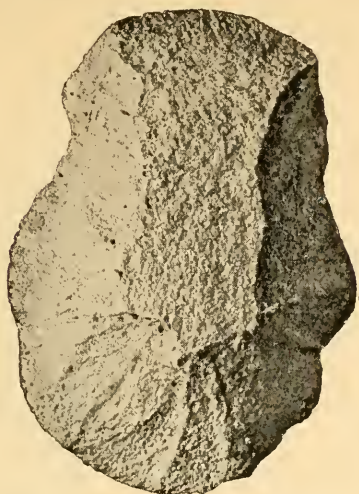
POLISHED STONE HATCHETS OF FLINT.

Showing process of manufacture, Europe (after Mortillet).

Stone hatchets in process of manufacture, chipped but not yet ground or polished, from the United States of America. Similar objects belonging to prehistoric times are found in nearly every country.

Polished stone hatchets are representative implements of the Neolithic period throughout the world. They vary greatly in size. They were intended for the same general purpose as the grooved ax, and the same remarks as to material and

mode of manufacture apply. On the coast and among the islands similar hatchets were made of shell (fig. 16). Polished stone hatchets were inserted in wooden handles, though in the Lake Dwellings of Switzerland horn was used as an intermediary. Nearly every country is represented. Eighteen specimens from Europe; 9 specimens from Asia; 11 specimens from the United States and Canada (fig. 15); 2 specimens from Mexico; 6 specimens from Central America; 6 specimens from West Indies; 5 specimens from South America. Total, 57 specimens.



PALEOLITHIC (?) IMPLEMENTS FROM THE DISTRICT OF COLUMBIA. QUARTZITE.
Chipped on one side only.
(Half natural size.)



PALEOLITHIC (?) IMPLEMENTS FROM THE DISTRICT OF COLUMBIA. QUARTZITE.
Chipped on both sides.
(Half natural size.)

UNITED STATES OF AMERICA.

EVIDENCES OF THE EXTREME ANTIQUITY OF MAN.

The existence of man on the American continent during a stage of culture corresponding to the Paleolithic period in Europe has been the subject of much dispute among American anthropologists and geologists. The investigations in this respect in the United States of America have not been so profound as in Europe, and anthropologists are not unanimous concerning the conclusions to be drawn therefrom. The contemporaneity of the periods in the two hemispheres has not been universally accepted, nor has the relationship of the men who made or used the implements been established.

Implements similar in form, style, and manufacture to those of the Paleolithic age from European countries have been found in the United States, which, if found in Europe, would be accepted as belonging to that age. These have been found by the hundred in every section of the United States on the surface and at varying depths in the gravels of several rivers, and in the Pleistocene deposits. Flint, argillite, and quartzite were the materials mostly used. The implements are rude and thick and always chipped. Twenty-one implements from every part of the United States are shown.

Fossil human thorax. Seven vertebra with corresponding ribs and sternum, from Osprey, Sarasota Bay, Manatee County, Fla. The bones are fossilized. They were found on the seashore incased in indurated ferruginous sandstone. The two pieces of stone belong together and form one subject; they were broken in extraction. The sandstone was overlaid by surface deposits $1\frac{1}{2}$ to 3 feet. Geologists assign it to the Quaternary period. Found by Judge John G. Webb.

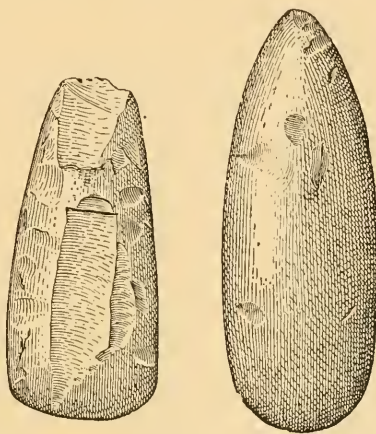


Fig. 11.

Fig. 12.

POLISHED STONE HATCHETS OF FLINT.

Showing process of manufacture, Europe (after Mortillet).

Fossilized human skull, turned to iron. From Osprey, Manatee County, Fla. Found in 1868 at a depth of 2 or 3 feet in the undisturbed subsoil in proximity to a shell heap. The skull was accidentally broken at its discovery. The skeleton was in place. The bones were sent forward, but some of them were lost. Part of them are now in the Peabody Museum. The skull and other bones were turned to limonite (hydrous sesquioxide of iron) by process of fossilization. The measurements of the skull are: Glabella to occipital protuberance, 170 mm.; breadth above the auditory meatuses, 131 mm.; breadth of the forehead at temporal ridges, 102 mm. Found by Judge John G. Webb.

Fossilized human thigh bone, changed to iron. A piece of limonite (hydrous sesquioxide of iron) containing a portion of a human thigh bone which has itself been changed to limonite. From Sarasota Bay, Florida. Collected by Col. Joseph Wilcox, of Philadelphia.

Rock formation from Sarasota Bay, Florida, containing fossilized shell of (1) Venus, (2) Pecten, (3) Fasciolaria tulipa, and others overlying the limonite formation containing the human remains from the same locality. These shells belong to the Quaternary Geologic period as well as to the recent. Collected by Col. Joseph Wilcox, of Philadelphia.

Fossil pyrula shell, bearing a prehistoric engraving of a mastodon. This shell was found in a peat bed near Claymont, Del., by Mons. Surault. It was associated with prehistoric objects of stone and bone. It bears an engraving or etching in outline of a Mastodon, and has every appearance of antiquity. The species of shell is native to the Atlantic coast of the Southern United States.

Chert implements of human manufacture said to have been taken from the Equus beds of San Diego, Tex. The Equus beds belong to the Quaternary Geologic period and contain fossil bones of the Mylodon, Megalonyx, Equus, Elephas, and other extinct animals. Late investigations by Mr. H. C. Mercer causes the belief that these implements were on and not in the Equus deposits.

Prehistoric implements found in the auriferous gravels under Table Mountain, California. In past geologic ages, the Stanislaus River ran in a different channel, 2 or 3 miles distant from the present channel, and at nigh 2,000 feet greater altitude. This ancient channel was of coarse gravels brought down from the mountain, and they contain the gold that has given the State the name of El Dorado. The

gravels reached a thickness in many places of 200 feet, and became indurated, possibly the result of an outflow of volcanic mud or cement. After this an eruption of volcanic basalt ran down the stream, filled the channel, and covered it and the adjacent country with a sheet of lava hundreds of feet in thickness. It is sometimes divided into layers. This eruption, aided possibly by subsequent glaciers, displaced the stream and drove it to its present channel. All this happened at such a distant period of time as that the new channel has since been eroded nigh 2,000 feet below the lava cap. The gravels in the ancient channels are now pierced by shafts and tunnels in search of gold. These explorations are declared to have brought to light human and animal remains and objects of human industry, which, if true, demonstrates the high antiquity of man in America.

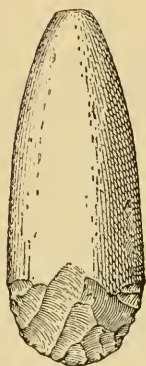


Fig. 13.

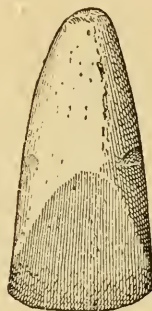


Fig. 14.

POLISHED STONE HATCHETS OF FLINT.

Showing process of manufacture, Europe (after Mortillet)

Mortars and pestles. From under the lava beds of Table Mountain, California. This mortar and pestle were, with other stone mortars and several obsidian spearheads, found by Mr. J. H. Neale in the Montezuma Tunnel, 1,500 feet distant from its mouth and 300 feet under the solid lava cap of Table Mountain. Collected by Dr. R. I. Bromley, of Sonora, Cal., and Mr. George F. Becker, Geological Survey, Washington, D. C. (Bul. Geol. Soc. Amer., Vol. II, p. 189.)

Calaveras skull. From "The auriferous gravels of the Sierra Nevada of California." (Mem. Museum Comp. Zoology, Harvard College, by J. D. Whitney.) This broken skull was found in Calaveras County, Cal., February, 1866, in the auriferous gravels 132 feet beneath the surface, in a shaft while digging for gold. There were four layers of volcanic lava over it, 40, 30, 15, and 9 feet, respectively, with intermediate layers of gravel. According to Professor Whitney it was a Pliocene deposit; others have denied this and have assigned it to a much later date, but, without discussing the age of the deposit, it is believed to be of high antiquity and belonged to a past geologic period. The authenticity of the skull has been attacked, but favorable evidence is accumulating; objects of undoubted human industry are being found in the same horizon, and disbelief in its genuineness is passing away. The original skull is in the Museum of Comparative Zoology at Harvard College, Cambridge, Mass.

Polished stone pestle. This implement came from the cemented auriferous gravel under the basalt or lava cap of Table Mountain, California. The finder was Mr. Clarence King, then director of the Geological Survey of the United States. He found it in place while searching for fossils. It is fine-grained diabase. No doubt can exist as to the authenticity of the implement, its being of human industry, or its extraction from the original place of deposit.

Stone implements from the auriferous gravels of California. These are enigmas of prehistoric science in North America. If any reliance can be placed in human testimony, we must believe that these, with mortars and similar objects to the number of several hundred, have been found under volcanic lava beds, and that they belong to a past Geologic period. If thus found, they are among the earliest known implements made by man, and yet they would seem to be of the Neolithic or Polished Stone civilization, and so would belong to prehistoric man

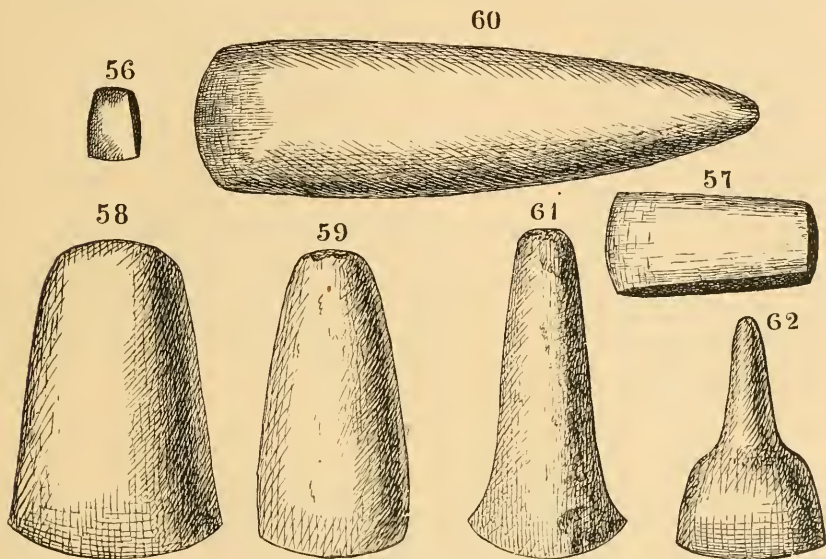


Fig. 15.

POLISHED STONE HATCHETS.

56, hematite, Ohio; 57, greenstone, Indiana; 58, syenite, Illinois; 59, greenstone, Tennessee; 60, chloritic slate, Tennessee mound; 61, yellow flint, Louisiana; 62, greenstone, North Carolina.

in the present Geologic period. The objects are mortars and pestles of hard stone, obsidian leaf-shaped implements, steatite bowls, ladles, and platters, hammers or sinkers with a pecked groove around. These contradictions must await the investigation of the geologist and paleontologist as well as the archaeologist.

Obsidian spearhead from the Walker River Canyon, in the extinct Quaternary Lake Lahontan. Found by Mr. W J McGee, of the Geological Survey, in undisturbed clay deposits, 25 feet beneath the surface, and "associated in such manner with the bones of an elephant or mastodon as to leave no doubt as to their having been buried at approximately the same time." (Geological History of Lake Lahontan, Vol. XI, p. 246.) Professor Gilbert, chief of the geologic work, says (Anthrop. Journal, Washington, Vol. II, October, 1889, p. 312): "This object was indubitably made by man; was from a well-determined date (the second occupation by an ice sheet of the Laurentian basin). It was found in situ and by a trained observer, who recognized the importance of his discovery before he disturbed the matrix inclosing the implement."

The second obsidian spearhead was found in the débris of an excavation in Mono Lake, California, in marls of the same age as those of the Walker River Canyon, and which Mr. McGee says are "presumptively Quaternary."

The third obsidian spearhead was found projecting from the face of a precipice of Columbia (early Quaternary) loam at the head of Chesapeake Bay, Maryland. These objects were all collected by Mr. McGee, who, while admitting their evident human origin, does not accept them as evidence of the contemporaneous existence of man.

Obsidian spearheads. These, with other prehistoric implements, are found in abundance in the sandy bed of an extinct lake in southeastern Oregon. It has been named Fossil Lake, from the number of fossil remains of birds and animals found therein belonging to the Quaternary Geologic period. The implements are so intimately associated with the fossils as to indicate their contemporaneous deposit. Two specimens, collected by Prof. E. D. Cope. Section of prehistoric rock-shelter, Claymont (Naaman's Creek), Del. The structure is shown in the sectional drawing. There was a cavity

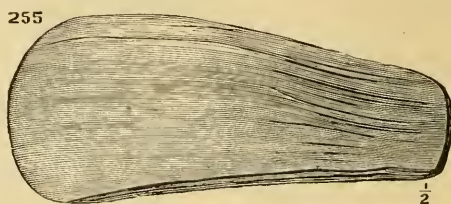
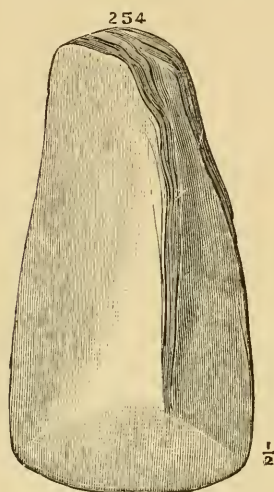


Fig. 16.

SHELL HATCHETS.

Like those of polished stone: 254, Florida; 255, Kentucky.

in the solid rock 20 or 30 feet wide and 5 or 6 feet deep. It has been occupied by prehistoric man, and the various layers, with their débris, show the different periods. Layers B, D, F, and H contained prehistoric implements, of which those in the three trays B, D, and H are samples. The upper layers contained arrowheads, pottery, and objects identical with the neolithic culture, while the lower layers contained large, rude implements resembling those of paleolithic culture. Collected by Dr. Hilborn T. Cresson, of Philadelphia.

Tray I, Layer B:

Paleoliths, quartzite	2
Paleoliths, argillite	6

Tray II, Layer D:

Small, rudely chipped implements, arrow and spear heads, broken points, flakes, etc.	35
---	----

Tray III, Layer H:

Small, rude implements of quartzite, jasper, etc., arrow and spear heads, scrapers, worked flakes, lower part of polished hatchet, and fragment of pottery	38
--	----

(See Proceedings Boston Soc. Nat. Hist., Vol. XXIV, p. 141 et seq.)

Rough, chipped, unpolished stone axes or adzes, notched on both edges, many specimens showing that the notches were used by means of a withe or thong apparently for the attachment of a handle. They are mostly of porphyritic

felsite (fig. 17), quartzite (fig. 18), and hard clay slate. These are found principally on the Atlantic seaboard from Massachusetts to Georgia, though they have

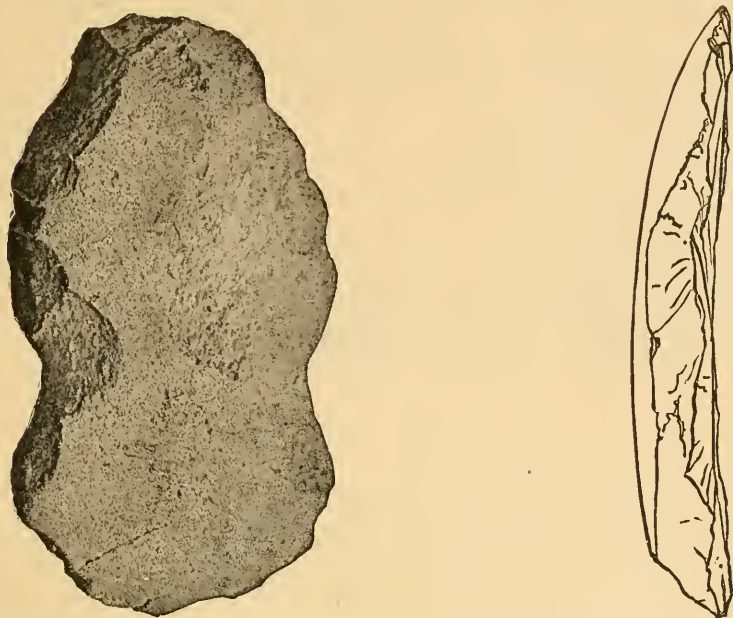


Fig. 17.

RUDE NOTCHED AX.

District of Columbia, Quartzite. Half natural size

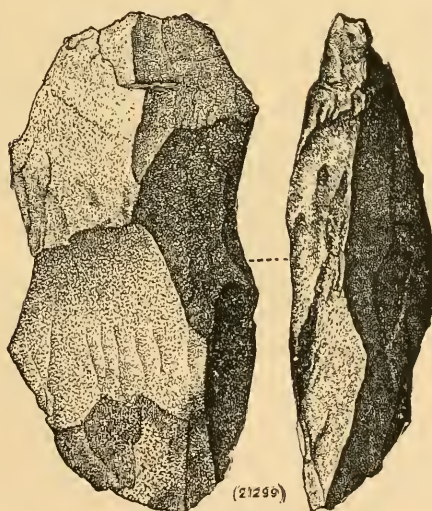


Fig. 18.

RUDE NOTCHED AX, PORPHYRITIC FELSITE.

Raleigh, N. C.

been found in the West. They may have been the precursor or ancestor of the grooved stone axe of North America.

PREHISTORIC IMPLEMENTS OF USUAL FORM.

Scrapers. These are of various forms and material (fig. 19). (a) Disk shaped, chipped both sides and all around. (b) Long round end, the scraping edge beveled from one side, the lower surface being formed by a continuous fracture. This form is common all over the world and has continued without change from prehistoric into modern times, the Eskimo of to-day using similar implements inserted in

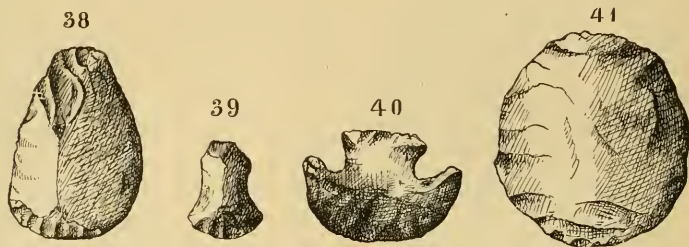


Fig. 19.

SCRAPERS.

38, gray flint, Texas; 39, hornstone, Ohio; 40, yellow jasper, Ohio, with arrowhead stem; 41, chalcedony, Texas, chipped round.

wooden or ivory handles. (Mason, *Aboriginal Skin Dressing*, Rep. U. S. National Museum, 1889, p. 553, Pl. LXXII to LXXIX.) (c) Forms peculiar to the United States are stemmed, notched, and shouldered, and their similarity to arrow and spear heads suggests a secondary use of broken specimens. The scraping edges of these, unlike class *b*, are chipped from both sides. Twelve specimens.

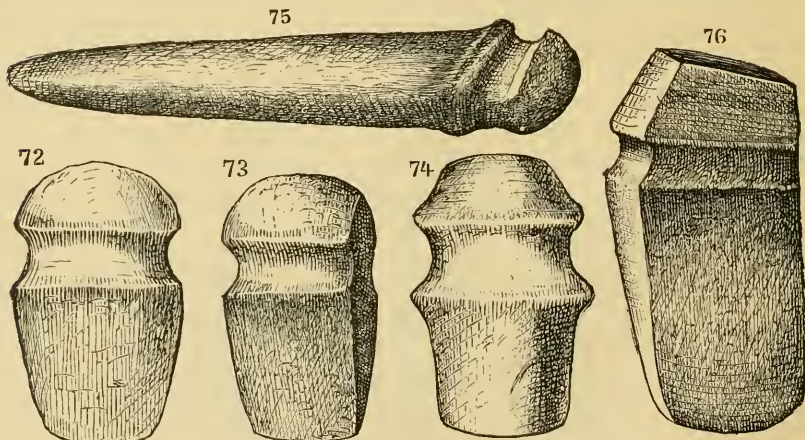


Fig. 20.

GROOVED STONE AXES.

72 greenstone, Massachusetts, groove all around; 73, greenstone, Arizona, flat back; 74, greenstone, South Carolina, groove all around, projecting ridges; 75, Wisconsin, oblique groove; 76, greenstone, Alaska, square with flat back.

Grooved stone axes (fig. 20) are distributed throughout the United States, and are not found in Europe. The groove is transverse and was for the attachment of a handle by a thong or withe. The material differs with the locality, but granite, trap, and rocks that would not flake were used. Water-worn pebbles served as well as quarried rock. They were chipped or pecked into shape according to material, and if smoothed or polished it was done by rubbing or grinding.

Grooved stone axes have been classified as follows: (1) Grooved either wholly or partially, some with projecting wings. (2) Flat back for insertion of tightening wedge. (3) Double bitted. (4) Hematite from valleys of Mississippi River and its tributaries. (5) Actinolite from the Pueblos of the Southwest. (6) Winged and horned, from the West Indies and Central America. (7) Longitudinal flutings on the bit. Eighteen specimens.

Eight specimens of grooved stone axes from Central and South America and West Indies. There is a certain resemblance between the grooved axes of these countries and those of the United States, while they bear no resemblance to European implements. They are chipped or pecked into shape and then ground or polished as in the United States. The grooves are different, forming wings or horns, while the edge is practically the same.

Mauls. Large quartzite pebbles bearing a groove for attachment of handle by means of a withe (fig. 21). These were used in the mines and quarries to break open the rock. They are principally from Lake Superior and the Rocky Mountains.

Adzes. These are, apparently, only a variation in form and use from the grooved ax and polished stone hatchet and gouge. They are rare. Their distribution

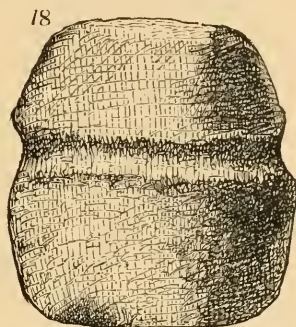


Fig. 21.

GROOVED MAUL OF GRANITE.

Colorado. Weight, 11 pounds.

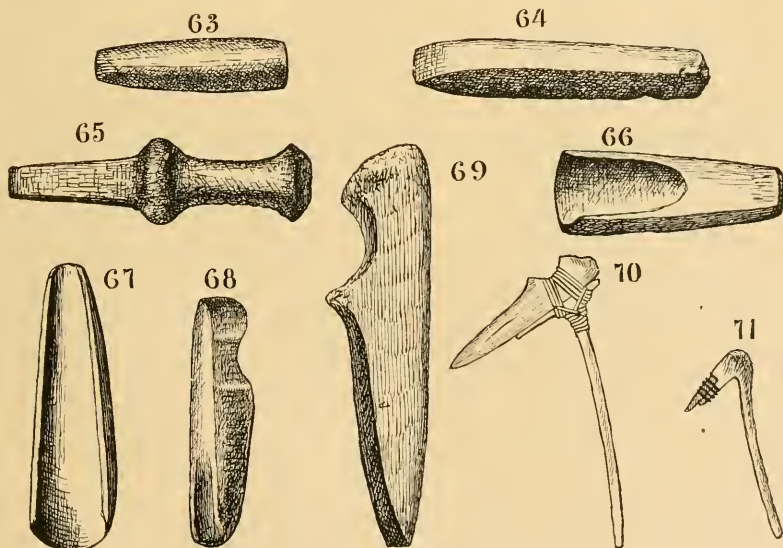


Fig. 22.

CHISELS, GOUGES, AND ADZES.

63, chisel, diorite, Ohio; 64, chisel, lydite, New York; 65, chisel, basalt, Unalaska; 66, gouge, hornstone, New York; 67, gouge, Pennsylvania; 68, gouge, greenstone, Massachusetts; 69, adz, hornstone, British Columbia; 70, adz, greenstone, Oregon; 71, adz, serpentine, Northwest Coast.

in the United States seems to be limited to the northeast Atlantic and northwest Pacific coast (fig. 22, 69-71).

Gouges. These are similar to the grooved axes and polished stone hatchets in material, mode of manufacture, and in every way except form. They were probably handled and used in the same manner. Those of the southern coast and the West Indies are of shell. They are more plentiful in the Atlantic States, and are perhaps confined to that area (fig. 22, 66-68).

Chisels. These, as will be apparent from examination of the figures, are but variations of the polished stone hatchet. Indeed, if the hatchet without a handle be taken in the hand and used in connection with the mallet, no reason is seen why, except in size, it and the chisel may not have served the same purpose. They are brought to a smaller or narrower edge than was the hatchet. The sides, whether round or square, are nearer parallel, while the head is not pointed but is large enough to receive a blow from the mallet. Nos. 63 (diorite from Ohio) and 64 (lydite from New York) are typical chisels from the interior eastern States, while 64 (of basalt and of a peculiar shape) is marked in the collection as an "ice chisel," from Unalaska Island.

26

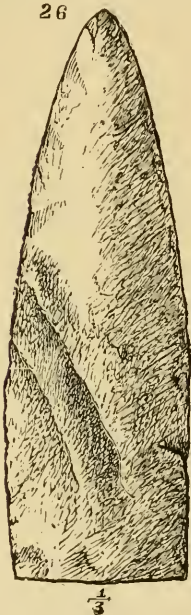


Fig. 23.

ARGILLITE LEAF-SHAPED IMPLEMENT.

Cache in Chester County, Pa.

Bunts. An arbitrary name given to this object, having no relation to any supposed use. They resemble somewhat the chipped and unpolished stone hatchet. They are of white chert of Missouri and Illinois, but are peculiar in that they are flat on one side, showing the fracture from the nucleus unwrought, all chipping being on the opposite side, after the manner of scrapers.

Caches. Chipped implements of leaf-shaped and other forms have been found in cache in various parts of the United States. Most of them are leaf-shaped in form, though some are oval and others round. Many are of flint, quite thin, and finely finished; others of quartzite, are larger and naturally ruder. Some of chalcedony have been wrought into spearheads with stem and barb. They are larger than usual and evidently completed weapons. No explanation yet given will satisfactorily account for them in their condition. They were placed in the cache in different positions, but always with regularity, on the flat, or edge, in circles or parallelograms, separate or overlapping. The number in the caches vary from 10 to 100 or 200, though that in Mound No. 2, Hopewell farm, near Chillicothe, Ohio, contained 7,232. (See fig. 9, Mr. Mercer's report.)

Sixty-one argillite leaf-shaped implements, part of a cache of 95 found at Marshallton, Chester County, Pa., by Mr. Edward T. Ingram, in 1890 (fig. 23). The cache is sought to be reproduced and the implements shown as in the original deposit. The top layer was disturbed by the plow.

A cache of leaf-shaped quartzite implements from the bank of the River Wantanga, Carter County, northwest Tennessee. It consists of 18 pieces, $7\frac{1}{2}$ to 9 inches in length, 3 to $3\frac{1}{2}$ in width, and five-eighths to seven-eighths in thickness. They were buried 2 feet below the surface, laid on the flat side and arranged in a circle with the points to the center, the cache being about 2 feet in diameter. The hole in which they were deposited was dug through the soil and into the hard yellow clay. Nothing was found associated with them, although there was an aboriginal cemetery in the neighborhood. Deposited by Thomas Wilson.

A cache of chalcedonic spearheads from the valley of the Little Missouri, Pike County, southwest Arkansas. The excavation in which they were buried was in yellow clay at 2 or 3 feet deep. They were laid side by side with edges overlapping. They varied in size from $5\frac{1}{2}$ to 9 inches in length, $2\frac{1}{4}$ to $3\frac{1}{2}$ in width, and one-half to five-eighths in thickness. Deposited by Thomas Wilson.

Chipped flint disks. These are peculiar to the Mississippi, Ohio, Tennessee, and Cumberland River valleys. Their use is unknown. They are of coarse, black flint, made from nodules, are always chipped, never polished, and the edges sometimes show signs of wear (fig. 24). They have usually been found cached in mounds and other prehistoric works. These implements have been found in Ohio in caches containing 8,000 specimens, in Illinois of 5,000, 3,500, down to 50.

Prehistoric quarries and workshops at Flint Ridge, in Licking County, Ohio, near the eastern boundary, equidistant from the towns of Newark and Zanesville. Flint Ridge is a stratum of flint, continuous with the ferruginous limestone of southeastern Ohio, lying on the Putnam Hill sandstone of the Ohio survey. The stratum of flint is from 4 to 8 feet in thickness and from 4 to 10 feet beneath the surface. It is about 8 miles east and west and 2 miles north and south. It is irregular in shape, having been much eroded by small streams. The prehistoric quarries were made by sinking shafts through the surface clay and then working out the flint by means of fire and water. The pieces were broken up and carried to the workshops in the immediate neighborhood and there worked into utensils and implements, making or leaving the debris of material both of which are here shown:

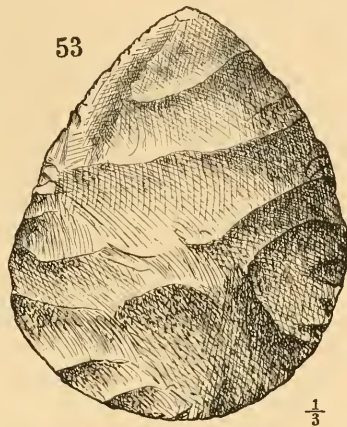


Fig. 24.

CHIPPED FLINT DISK.

Cache in Cass County, Ill.

Hammers	8
Material	4
Large chipped implements (rude)	14
Small chipped implements (rude)	40
Leaf shaped implements (thin)	16
Perforators, scrapers, arrowheads, etc.	37
Cores	16
Flakes	41

176

Trays, containing flint chips, implements, arrowheads, etc., showing the distribution of material in the workshops.

Some localities of the neighborhood were strewn with ruder and heavier material, while others had a profusion of small and fine chips, flakes, and debris. The latter were mostly on the high bluffs overlooking the valleys below, and from which position one could see far over the adjoining country. On these points the flints, chips, flakes, etc., were in such profusion as to prevent the grass forming a sod. I chose one of these spots and dug it out 10 by 12 inches square, 14 inches deep to the bottom of all flint debris and then washed out the earth. The flints were 7 inches deep and the earth 7 inches — half and half. The specimens from this hole are shown in the two trays in the case. They are as follows:

Complete and perfect arrowheads.....	51
Leaf-shaped:	
Perfect	9
Imperfect.....	16
	25
Cores: Finely wrought.....	15
Rude lumps of flint.....	34
Débris:	
Hard-burnt clay, small.....	2
Pebbles, not flint, small.....	13
Bits of wood, small.....	5
Chips and spawls, flint	3, 149
	3, 169
Total contents of hole.....	3, 294

Hammer stones are smooth, flat, or oval pebbles, nodules or rude pieces of broken stone, usually of the material nearest at hand, used as hammers or pounding stones for striking flakes, chips, etc., from a core or nucleus, or for pounding or pecking (attrition), by means of which stone implements are made into the desired shape (fig. 25). They are usually taken loosely in the hand and, if a rude piece, by turning so as to present a new surface for each blow, the corners are gradually worn off, and the hammer becomes round; if a smooth pebble, the edges become roughened. Specimens which have served as hammers show a small cup marking or depression on one or both sides, which have been thought to be for reception of thumb and finger. Their distribution is general throughout all prehistoric ages and countries.

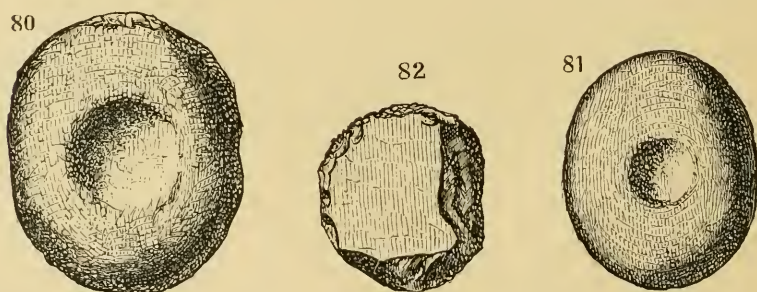


Fig. 25.

HAMMER AND PITTED STONES.

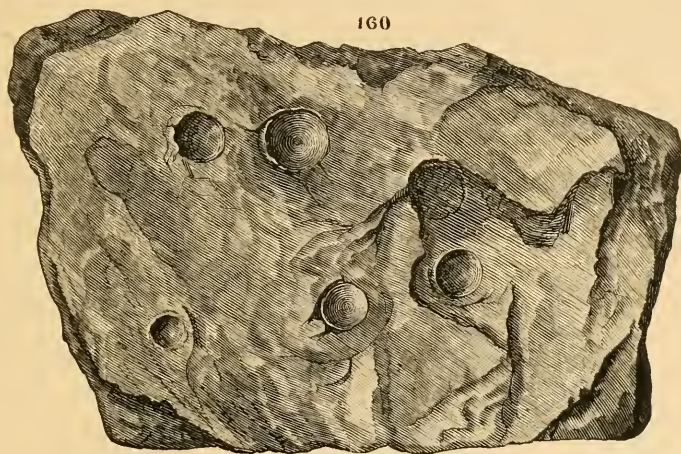
80 to 82, $\frac{1}{2}$ size. 80, quartzite, New York; 81, quartzite, Pennsylvania; 82, flint, Flint Ridge, Ohio.

Pitted stones are mostly flat or oval pebbles, the larger proportion of which in the eastern United States are of quartzite (fig. 25). They are similar in size and appearance to some hammer stones. They receive their name from a worked depression or cup-marking in the center of one or both sides, which have been thought by some persons to be (1) for holding with thumb and finger for use as a hammer; (2) made by hammering on another stone as a punch; (3) by cracking nuts. They are probably related to cup stones proper, and like them their use not satisfactorily determined.

Cup stones. Stones large and small are found marked by a depression, smooth or rough, varying in diameter from 1 inch to 4 or 5, and in depth from a slight hollow to a hemisphere (fig. 26). Small pebbles may have but one such depression or one on each side, when they are called pitted stones, but larger pebbles, even boulders of many tons, or solid rock, as in the Carpathian and Himalaya

mountains, have hundreds of these markings, when they are called "cup stones." The National Museum has one from Wheeling, W. Va., with fifty-three cup markings thereon. Their distribution is general throughout the prehistoric world and their use or purpose has never been satisfactorily determined.

160



160 a

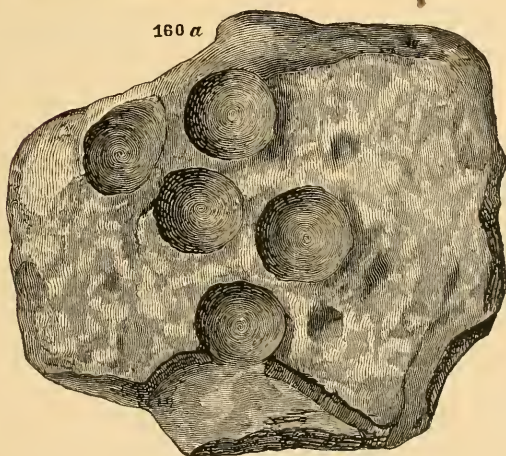


Fig. 26.

CUP STONES.

160, sandstone, Pennsylvania; 160a, sandstone, Kentucky.

CLASSIFICATION OF ARROW AND SPEARHEADS.

The primary divisions of arrow and spearheads or knives are as follows:

- I. Leaf shaped, classes A, B, C.
- II. Triangular.
- III. Stemmed, classes A, B, C.
- IV. Peculiar forms, classes A, B, C, D, E, F, G.

I. Leaf shaped. This division includes elliptical, oval, oblong, and lanceolate forms bearing any relation to the shape of a leaf, and without stem, shoulder, or barb.

Class A is pointed at both ends. They are widest from one-third to one-fourth the distance from the base. Eleven specimens.

Class B is more oval, more or less pointed, with concave, straight, or convex base. Five specimens.

Class C is long, narrow, with parallel edges, concave, straight, or convex bases, and belongs principally to the Pacific Coast. Five specimens.

II. Triangular. This division includes all specimens which, according to geometric nomenclature, are in the form of a triangle, whether the bases or edges be convex, straight, or concave. They are without stems and, consequently, without shoulders, although in some specimens the extreme concavity of the base produces barbs. Eleven specimens.

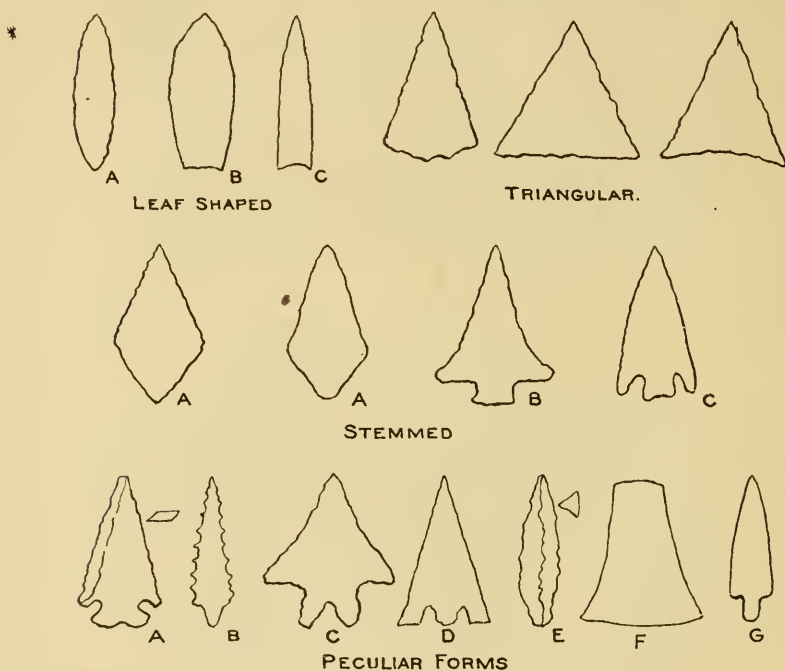


Fig. 27.

FORMS OF ARROW AND SPEARHEADS.

III. Stemmed. This division includes all varieties of stems, whether straight, pointed, or expanding, round or flat, whether the bases or edges are convex, straight, or concave.

Class A is lozenge shaped, stemmed, but not shouldered nor barbed. Eight specimens.

Class B is stemmed and shouldered, but not barbed. Sixteen specimens.

Class C is stemmed, shouldered, and barbed. Nine specimens.

IV. Peculiar forms. This division includes all forms not belonging to the three others, and provides for those having peculiarities, or which are restricted in number or locality.

Class A, beveled edges. Seven specimens.

Class B, serrated edges. Six specimens.

Class C, bifurcated stems. Seven specimens.

Class D, long barbs, square at ends, peculiar to England, Ireland, and Georgia, United States. Six specimens.

Class E, triangular in section, peculiar to the province of Chiriqui, Panama. Eight specimens.

Class F, broadest at cutting ends—tranchant transversal—peculiar to Western Europe. Nine specimens.

Class G, slate and polished, peculiar in North America to the Eskimo country, and to New England and New York. Ten specimens.

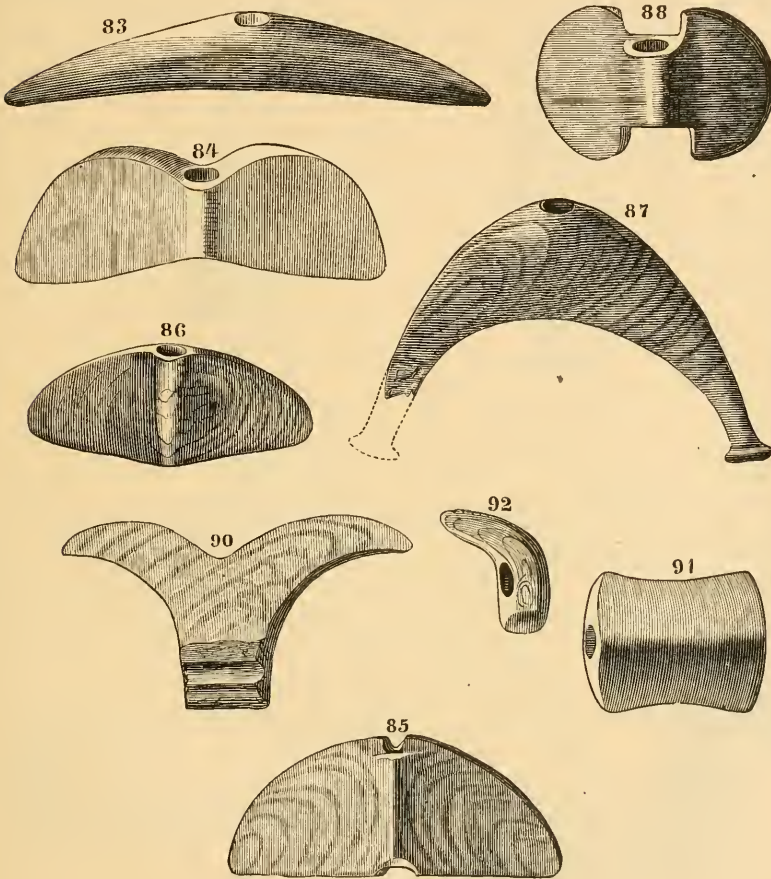


Fig. 28.

CEREMONIAL OBJECTS? OR "BANNER STONES."

83, Serpentine, Virginia; 84, serpentine, Pennsylvania; 85, striped slate, Wisconsin; 86, striped slate, Indiana; 87, striped slate, Pennsylvania; 88, brown jasper, Louisiana; 89, striped slate, Indiana; 90, striped slate, Indiana; 91, ferruginous quartz, Indiana; 92, striped slate, Indiana.

SUPPOSED CEREMONIAL OBJECTS.

Banner stones, drilled tablets, boat-shaped and bird-shaped objects, etc. The names given to these objects are no indication of their use, which is only conjectural. They are all American, and are found in mounds and aboriginal graves, some of them so associated with human skeletons as to indicate their use as personal ornaments. They may have served as charms, amulets, or, as the general name above suggests, for occasions of ceremony. Some have been drilled for suspen-

sion, the holes showing signs of wear, others apparently for a handle, although it would be too small for service as a weapon. Some are soft and fragile, while others are extremely hard. The edges show no signs of use. No early Indian traveler or historian mentioned them, and they had apparently fallen into disuse before the advent of the white man.

Banner stones (fig. 28) present a great variety of forms and an equal uncertainty of use. They are supposed to have been for ceremony or ornaments, or, with long handles, to have served as badges or insignia of rank (*baton de commandement*). They were not weapons, since most of them are of soft material, usually of slate, are fragile and would break under even a slight blow; have no cutting edge, while the hole is too small for a serviceable handle. A few are of hard material

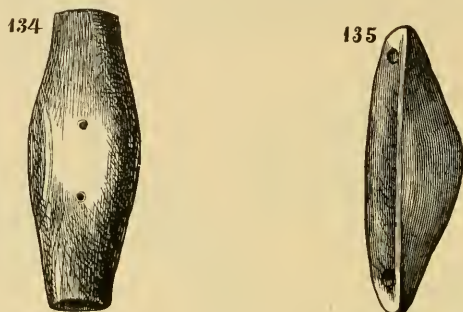


Fig. 29.

BOAT-SHAPED (?) OBJECTS.

134, striped slate, Ohio; 135, greenstone, Kentucky.

like quartz, jasper, etc., nevertheless they are impracticable alike for battle axes or casse tetes. The specimens show the process of manufacture. They were hammered or pecked into form, and then polished before being drilled. The drilling is excellent. The broken specimens show a secondary use, having been drilled and used since the fracture. They belong principally to the interior, though they have been found on the Atlantic coast line.

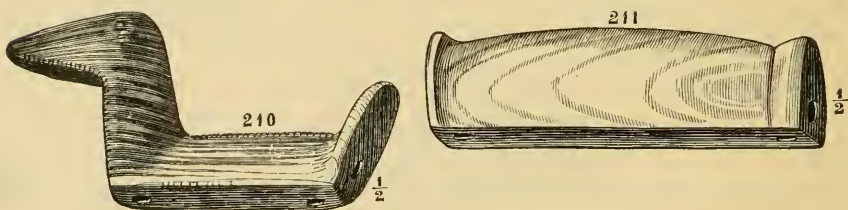


Fig. 30.

BIRD-SHAPED (?) OBJECTS.

210, striped slate, Pennsylvania; 211, striped slate, Ohio mound.

Boat-shaped objects (fig. 29). The title indicates our want of knowledge concerning their purpose. Different uses have been assumed for them, such as twine-twisters, handles for carrying parcels, or for tightening cords, but all without evidence. Some of the objects are solid, others are hollowed out like a boat, and are finely finished. Most of them have two perforations equidistant from the center. The material is syenite, chlorite, slate, and galena. They are found principally in the valleys of the Mississippi and its tributaries. Six specimens.

Bird-shaped objects (fig. 30). A class of objects, bird-like in form, but passing gradually into other conventionalized forms. They generally stand on flat bases and are pierced with a diagonal hole at either end. In some cases the eyes are not represented; in others they are marked by bead-like protuberances expanding into disks. Some specimens were not intended to represent either birds or animals, but are in the form of a bar with both ends alike. Various theories of their use have been advanced as knife handles, corn huskers, etc., but none are satisfactory. They may have served for gaming. The material is usually banded or striped slate, though hard stones were employed. Five specimens.

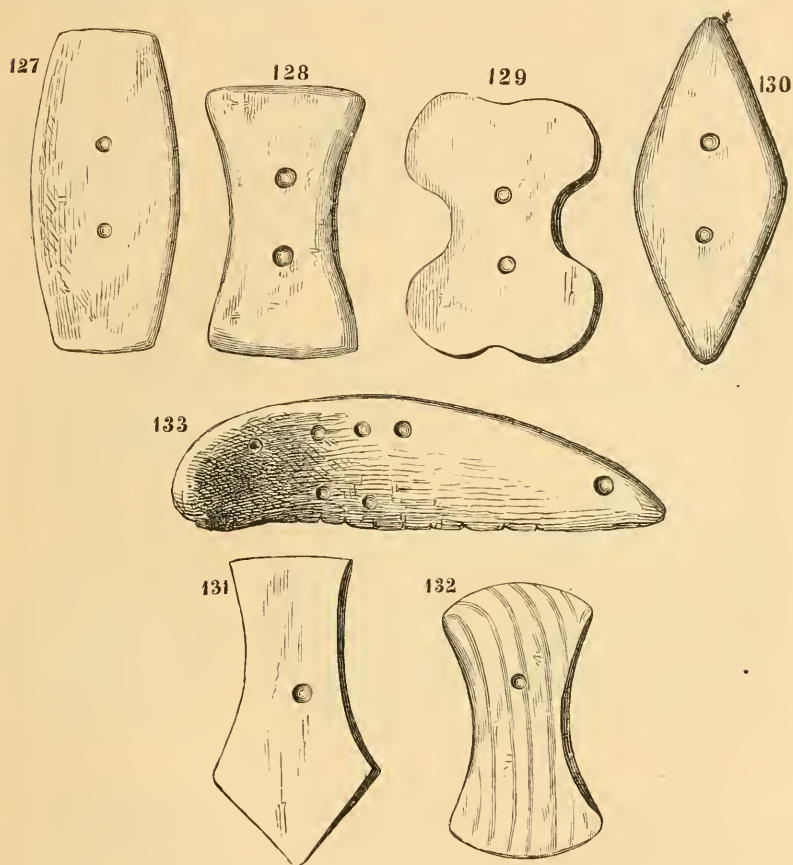


Fig. 31.

PIERCED OR DRILLED TABLETS.

127, slate, New York. 128, slate, Pennsylvania; 129, slate, Louisiana; 130, slate, Tennessee; 131, slate, Tennessee; 132, striped slate, Tennessee.

Drilled tablets (fig. 31) are flat, thin pieces made of striped, or banded slate, or chlorite. They have one or two holes drilled, some from both sides others from only one. The edges of the holes are many times worn by cord or sinew but are frequently sharp and without signs of wear. They are found in mounds or graves on the breasts and arms of skeletons. They may have served as badges, ornaments, or charms. Ten specimens.

Discoidal stones (fig. 32) are always round in outline; the sides may be convex, flat, or concave. In some specimens the concavity has been deepened until the cup became

a hole and the implement a ring. They vary in diameter from 2 to 6 inches, and are usually of hard stone, worked by pecking or grinding, or both, but with such perfection as to excite admiration. The larger ones were used by the Indians in a game called "Chungkee," described by early writers. Thirteen specimens. Sinkers, pendants, or charms (fig. 33). These names indicate the supposed use of these objects. They are usually pear shaped, are of hematite or some hard stone, well wrought and finely polished. Many have a slight groove near the smaller end, while more have no groove. They are in greater abundance in the interior than on the borders of lakes or oceans. Others having greater appearance of sinkers are pebbles, round or oval, with a well-defined, ground or polished groove

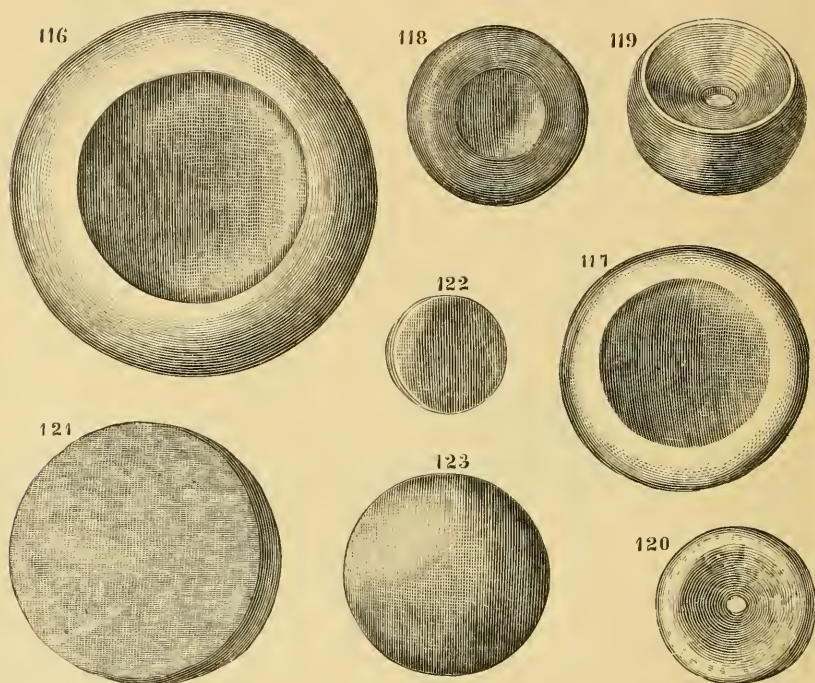


Fig. 32.

DISCOIDAL OR CHUNGKEE STONES.

116, ferruginous quartz, yellowish brown, Tennessee; 117, ferruginous quartz, brown, Tennessee; 118, greenstone, Illinois, mound; 119, Ohio; 120, quartzite, Ohio; 121, quartzose, Georgia; 122, argillaceous, Pennsylvania; 123, ferruginous quartz, Texas.

in the center, evidently for the use of a cord or thong. Still others, and more numerous, found in large numbers on the banks of rivers and lakes in the eastern United States, are naught but a flat pebble with rude notches on each edge or occasionally with a hole drilled in the center.

Perforators (fig. 34). These are peculiar to the United States. They are always of hard stone, usually flint, the point or borer is sharp, the shaft is chipped nearly round, is never polished, frequently 3 and even 4 inches long, and with slight taper. The top or handle is chipped broad and thin and fits easily in the thumb and finger, as if for use as a gimlet. Its form is such that it might have been used as arrow or spear head. The point is frequently rounded off and worn smooth, as though from use. They may have been used as an awl to bore hides or skins, as a gimlet to bore holes in wood, or attached to a shaft for drilling stone. These suggested uses have not all been accepted with unanimity. If

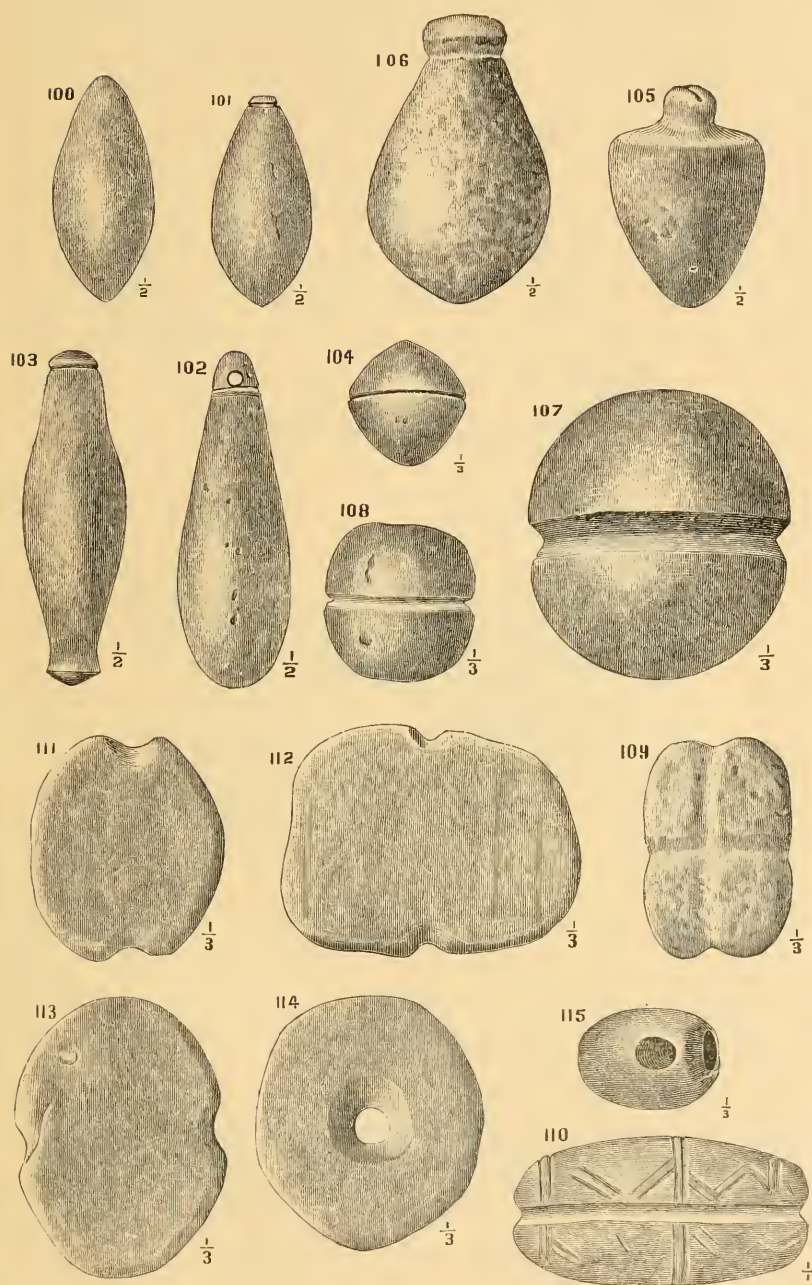


Fig. 33.

PLUMMETS, SINKERS, OR CHARMS.

100, hornblende, Ohio; 101, red hematite, Tennessee; 102, amygdaloid, Arkansas; 103, greenstone, Ohio; 104, greenstone, California; 105, quartzite, Massachusetts; 106, greenstone, Massachusetts; 107, granite, Rhode Island; 108, steatite, Georgia; 109, talcose slate, Rhode Island; 110, sandstone, Oregon; 111, quartzite, Pennsylvania; 112, graywacke, New York; 113, quartzite, Pennsylvania; 114, micaceous slate, California; 115, sandstone, Ohio.

used as perforators of hide or wood, why not employ a pointed bone; if for drilling a stone, why are they not found in Europe, where so much drilling was done? Their possible use as blunt arrows has been suggested and some claim them as charms, also as hairpins. Twenty-two specimens.

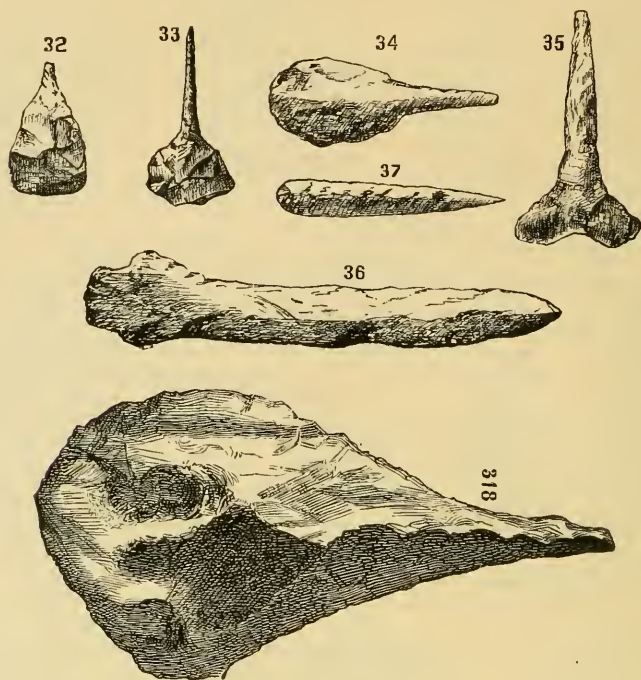


Fig. 34.

PERFORATORS OR DRILLS.

32, red jasper, Ohio; 33, brown jasper, Oregon; 34, white flint, Missouri; 35, gray flint, Ohio; 36, hornstone, Tennessee; 37, gray semiopal, California; 38, gray flint, Santa Cruz, California.

The aborigines of America were adepts in drilling stone. They drilled holes, large and small, straight and crooked, regular and irregular, parallel and conical, from one side or end or from both, with tools of wood and of copper, solid or hollow. They drilled hard stone like quartz, jasper, etc., as effectually as soft stone. Specimens of drilling are shown in pipes, and in the supposed ceremonial objects, but not in axes or hammers.

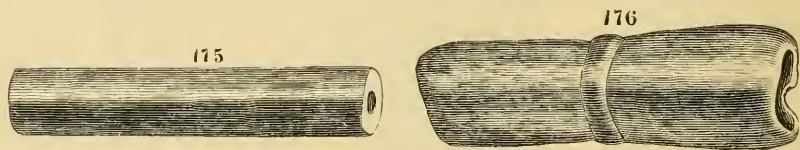


Fig. 35.

STONE TUBES.

175, steatite, Tennessee; 176, chlorite, Tennessee.

Tubes and pipes of stone, principally serpentine and steatite (fig. 35.) They were drilled and the hole enlarged at one end so as to form a pipe, and were used by the aborigines for smoking tobacco. They have been found in ancient graves on the Pacific coast with the mouthpieces of cane fastened with asphaltum.

Stone beads and ornaments (fig. 36) are found in graves of Indians and are of every kind, style, material, and mode of manufacture. Most of them have been drilled for suspension. Eleven specimens.

The pipes of North America demonstrate the ability of the aborigines to represent by modeling or sculpture living animals in clay or stone (figs. 37-41). The use of tobacco created the necessity for pipes, and their part in Indian ceremonies gave an opportunity for, as well as incitement to, art and skill in making these representations. Accordingly the pipes are of every practicable material and represent all possible, as well as some impossible, animals and objects.

Perforated stones, club beads, digging sticks, riattas, from Santa Cruz, Santa Barbara, Santa Rosa, the Catalina Islands, and the coast of Southern California (figs. 42 and 43). These were drilled through the center and some served for club heads or weights for digging sticks, while others more modern were riattas for stretching and smoothing lariats. They pass by degrees from thick and heavy to thin and flat. By enlargement of the hole they become rings. Some of the holes are much worn, others unworn. Four specimens.

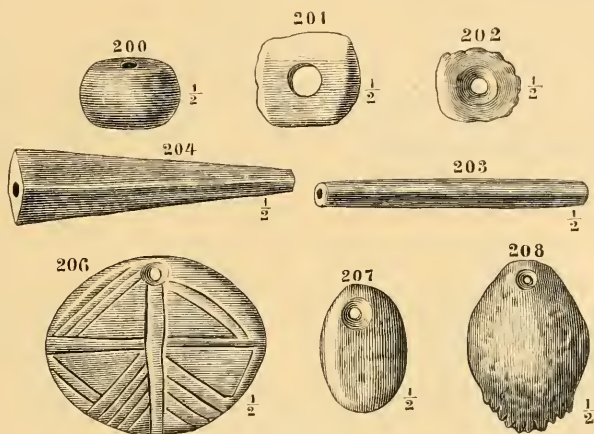


Fig. 36.

STONE BEADS AND ORNAMENTS.

200, serpentine, Santa Barbara, Cal.; 201, 202, steatite, Pennsylvania; 203, silicious material, Mississippi; 204, catlinite, Oriskany Canal, New York; 205, sandstone, Rhode Island; 206, sandstone, Pennsylvania; 207, hematite, Virginia.

Mortars and grinding stones (fig. 41). Mortars were in common use throughout the United States, apparently in all epochs of time. They are usually of stone of common hardness, though among the pioneers wood was employed. They are sometimes dressed on the outside as well as on the inside; at other times a rude round or oval boulder was used. They are of all sizes, holding from a quart to a bushel. The larger and finer specimens are found in California. The grinding stone (metate) is peculiar to Mexico, where it has continued in use until the present time.

Pestles and hammers (figs. 45 and 46). Pestles are in great variety, long and short, rude and finished, cylindrical and conical, decorated and plain. The various forms are well distributed from ocean to ocean. Those with cross handles and projecting ears are, however, peculiar to the northwest coast.

Steatite vessels (fig. 47). Steatite quarries, opened and worked by the aborigines, have been found on the Appalachian chain of mountains. These quarries contain vessels in various stages of completion, together with the tools employed in their manufacture. The vessels were frequently blocked out in the quarry and ear-

ried home to be finished. The oblong or oval form, with projecting ears for the handles, prevails in the Eastern United States, while the larger round and more perfectly finished vessels are more frequent on the Pacific Coast.

Stone picks for steatite quarrying (fig. 48). Some were grooved for a handle, as the ax, while others were held in the hand. Both were used in mining steatite and in the manufacture of vessels. The material was soft and easily worked, and the traces of the pick points are plainly to be seen on the partially completed vessels. The grooved picks were peculiar to the Atlantic Coast.

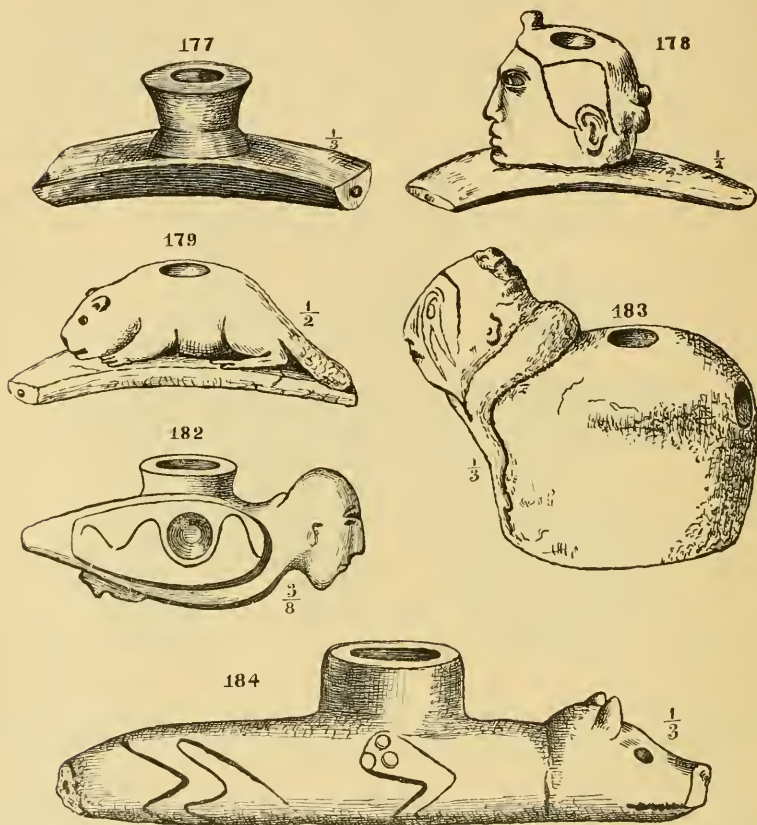


Fig. 37.

STONE PIPES.

Mounds in Ross County, Ohio: 177, platform or "monitor"; 178, Indian (?) head and head dress; 179, heaver; 182, porphyry, (bird with man's head); 183, red sandstone, (human head and body); 184, chlorite, (wolf). (?)

Collection of 69 specimens from Warren County, Ohio, consisting of finely chipped spearheads, daggers, knives, leaf-shaped implements, perforators, etc., of flint, principally from Flint Ridge; carved stone pipes, bird and boat shaped objects, perforated tablets, sinkers, pendants or charms of stone and hematite, small polished hematite hatchets, and copper spool-shaped objects. Exhibited by Mr. Warren K. Moorehead, of Xenia, Ohio. This collection is especially valuable, as it comes from one locality and represents one phase of aboriginal culture.

Hematite objects. Hematite is the anhydrous sesquioxide of iron. It was variously employed by the aborigines. They worked it as they did stone, and gave it a high polish. It served for grooved axes, polished hatchets, sinkers, pendants, or charms, and for muller and paint stones.

Mullers, paint stones, and cups (fig. 49). The harder hematite was made into mullers for grinding paint, though other stone was employed. The forms were various, but the conical prevailed. Other varieties of iron oxide, limonite, red and brown ocher, served as paint for personal decoration. It was preserved in small cups, usually of steatite.



Fig. 38.

STONE AND CLAY PIPES.

186, (argillaceous), Pennsylvania; 187, serpentine (loon) (?), West Virginia; 188, argillaceous (parrot), New York; 189, argillaceous, Ohio; 190, chlorite (platform) (?), Virginia; 191, serpentine, New York; 192, steatite (lizard), Pennsylvania; 193, steatite, North Carolina; 194, serpentine (4 human faces or masks), Texas; 195, limestone, Kentucky; 196, clay, Georgia; 197, serpentine (tube), California; 198, clay (coiled snake), New York; 199, clay (raven) (?), New York.

Digging implements (figs. 50-52). These are peculiar to the United States. They are of silicious material, chiefly the novaculite of Arkansas or the white flint of Illinois and Missouri, and are made entirely by chipping. Many are worn apparently by use, but some show a polish or luster not yet explained. They are more frequent in the Mississippi, Ohio, and Tennessee valleys than elsewhere. There are three forms of these implements:

1. Large flat objects of a regular oval outline, chipped to an edge all around, but used only on the larger end, which show a polish as though from use in digging in earth or sand. Average size, from 12 to 18 inches long, 4 to 6 wide, and three-fourths to 1 inch thick (fig. 50).
2. Smaller flat objects, triangular in outline, shortest side slightly rounded and chipped to an edge, occasionally showing signs of wear; 7 to 9 inches long, $4\frac{1}{2}$ to 5 wide, and three-fourths to 1 inch thick (fig. 51).
3. Still smaller, flat, nearly round, in outline, sharp all around at the edge, truncated on the top or poll, and notched as though for lashing to a handle with a thong or withe, though no signs of wear appear; 5 to 7 inches long, 4 to 6 wide, and three-fourths to 1 inch thick (fig. 52).

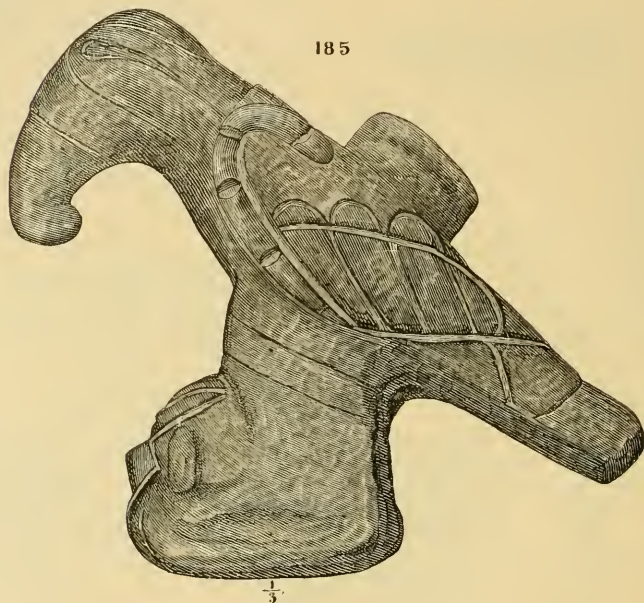


Fig. 39.

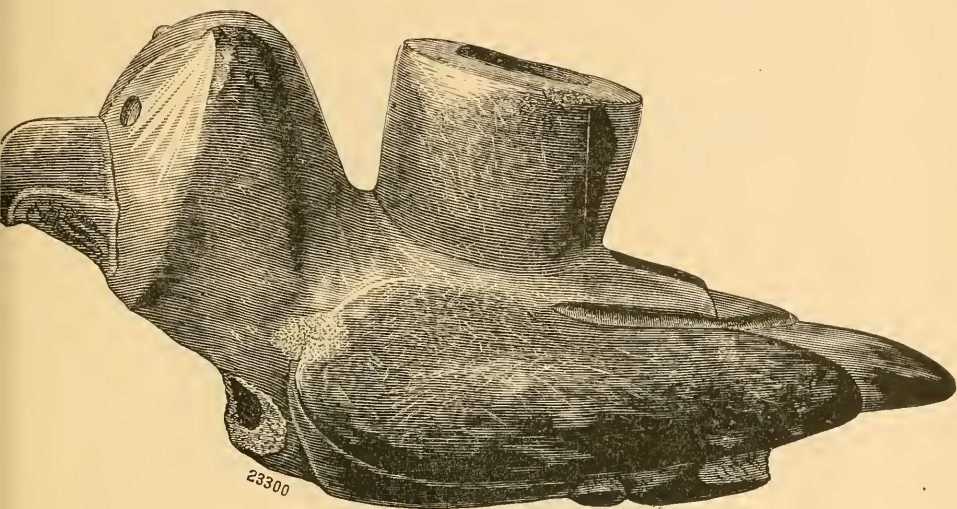
CALUMET PIPE.

Steatite, Kentucky.

Stone swords were made by the aborigines of the United States. They were chipped and never polished; they differed from the leaf-shaped implement in that they were longer and heavier; they differed from daggers in that they were not chipped so as to form a handle. Some were as long as 16 inches, and others reduced to 8. The handle was wrapped with skin, cloth, grass, or the like. The specimen here shown from the Hupa Indians, is but $5\frac{1}{2}$ inches long, and the handle is wrapped with otter skin (fig. 53), which possibly has some ceremonial or medicine significance. It was collected by Capt. P. H. Ray, U. S. A.

Stone daggers (fig. 54) are different from, and not to be confounded with, the leaf-shaped implements, which may have had wooden handles, and have been used indifferently as knives or spearheads. The daggers resemble the same weapon from Scandinavia, and are, like them, always chipped, and rarely or never polished. The handles have been worked out of the solid. They are rare in the United States.

Knives and flakes. These are of silicified wood from California. In form they resemble Mousterien points. Traces of bitumen on the base show their attachment to handles, while their general form indicates their use as knives. Many specimens have been thus marked, and they assist in determining the use of leaf-shaped and similar blades, so common throughout prehistoric times.



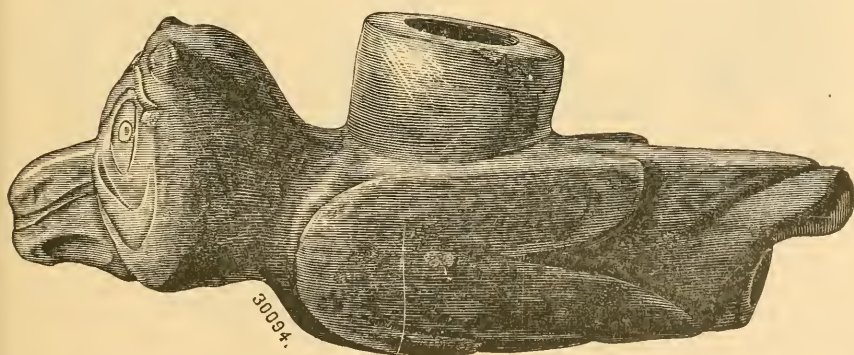
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Fig. 40.

CALUMET PIPE.

Chlorite (owl), Tennessee.

Leaf-shaped blades of black flint. These are beautiful specimens of aboriginal flint chipping. The largest specimen here is 240 mm. long, 125 mm. wide, and 1 mm. thick. They have been found with traces of bitumen or asphaltum for the attach-



$$\left(\frac{1}{2}\right)$$

Fig. 41.

CALUMET PIPE.

Chlorite (owl), Kentucky.

ment of handles. They are peculiar to the Pacific coast of southern California. In the classification of arrow—and spear—heads, these are Class C of the leaf-shaped implements.

Stone knives with wooden handles (fig. 55). These specimens include rude flakes and finely-wrought blades. They are fastened with bitumen or gum, in short, pointed handles, evidently for use as knives. They are of great importance to the science of prehistoric anthropology as showing the methods of attachment and use of flint flakes, blades, etc., in common use in prehistoric times. These are found principally on the Pacific Coast, though some have been found in Mexico and in Tennessee.

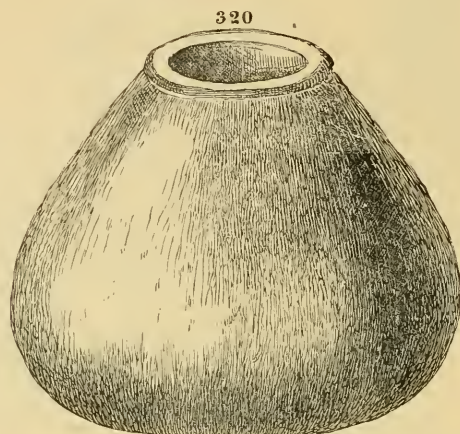


Fig. 42.

PERFORATED STONE CLUB HEAD.

320, green-stone, California.

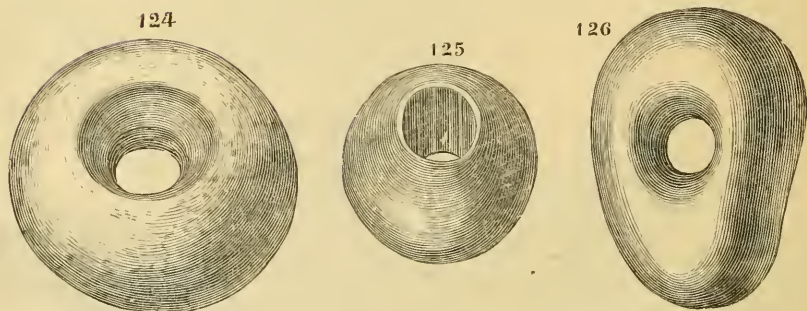


Fig. 43.

PERFORATED STONE BIATTAS.

124, hornblende, Santa Catalina Islands, California; 125, greenstone, Santa Rosa Island, California; 126, serpentine, Santa Rosa Island, California.

Slate knives are flat, thin with a semilunar edge and with a straight back made thicker and heavier, to be grasped in the hand (fig. 56). They chiefly occur along the coast and in the Northeastern States. Similar implements, likewise made of slate with a curved edge and a lateral tang, have been found in Pennsylvania and in Indiana. Varieties of these implements have been used in historic times by the Indians of the northwest coast as fish knives.

Spade-like implements of compact green stone, with long, heavy, round handles, have been found in the southern part of the United States (fig. 57). The one here shown was found in a Tennessee grave mound and belongs to Dr. Joseph Jones, of New Orleans. The handle at the largest part is about $1\frac{1}{2}$ inches in

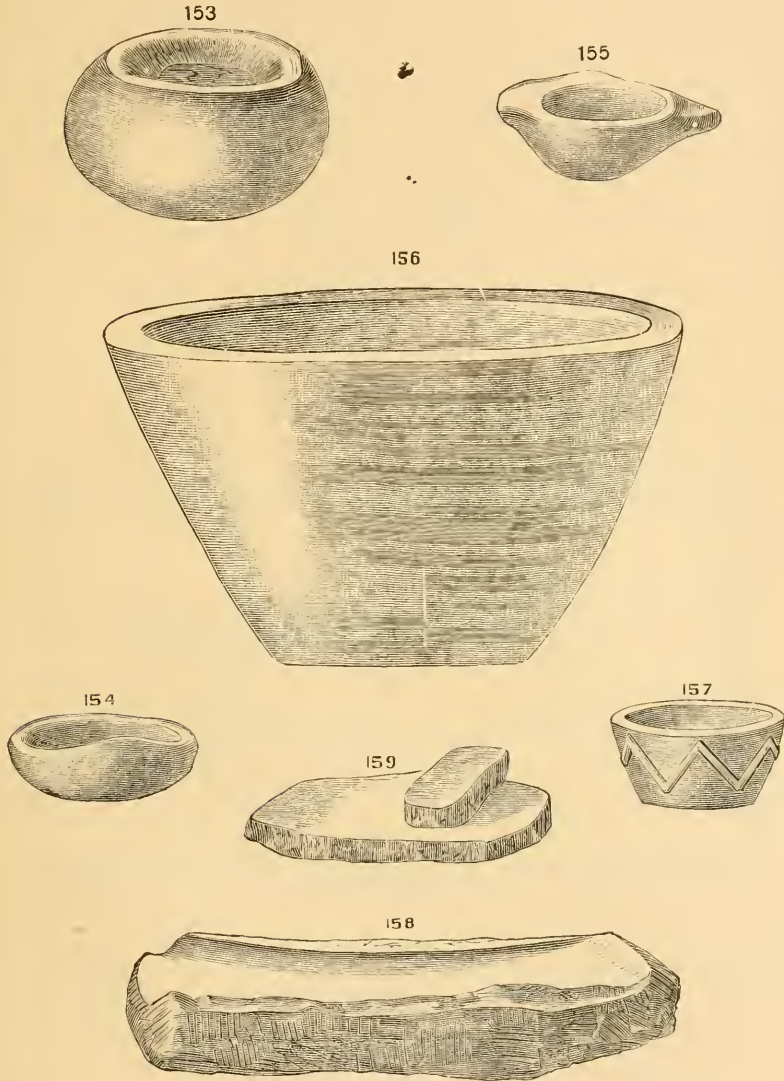


Fig. 44.

STONE MORTARS AND METATES.

153, 154 and 155, sandstone boulder, hollowed, St. Nicholas Island, California; 156, Dos Pueblos, California; 157, Santa Cruz Island, California; 158, metate sandstone, Utah (figs. 45 and 46); 159, metate, granite, sandstone rubber, Navajo, Arizona.

diameter, nearly or quite round, but flattened at the broadened end. It is $17\frac{1}{2}$ inches long. The edge is rounded off and shows no signs of wear. Its purpose is unknown. Similar implements have been found by Mr. Clarence B. Moore in Florida and southern Georgia and by Dr. Steiner in northern Georgia.

There is a class of well-finished and finely polished implements of which compact greenstone and chlorite and calcite were favorite materials, the use of which is unknown (fig. 58). They were broad, thin, and most of them flat. They were 5 or 6 inches wide, from 8 to 10 inches long, and rarely more than one-half an inch thick. The edge was rounded off so as to render cutting impracticable. They were provided with an indefinite handle, and many have a hole drilled at the commencement of the handle. They may have served for scraping or polishing, but no traces of use have been found which would indicate their purpose other than as mentioned. While these objects are rare in the United States most of them have been found in the South.

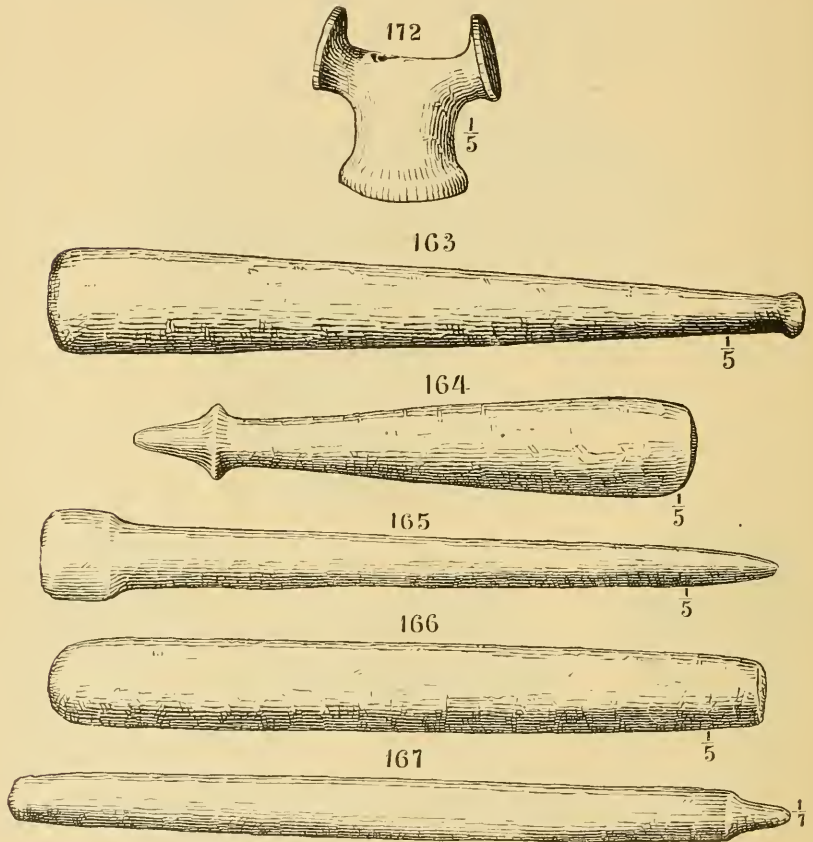


Fig. 45.

PESTLES.

163, sandstone, Dos Pueblos, California; 164, sandstone, Dos Pueblos, California; 165, amygdaloid, Crescent City, California, mound; 166, sandstone, Rhode Island; 167, greenstone, Alaska; 172, greenstone, Alaska.

Shell, horn, and bone served the prehistoric man like stone and copper as material for implements and ornaments (figs. 59, 60). They were made into axes, hatchets, swords, daggers, poignards, wedges, points, perforators, harpoons, fishhooks, beads, tubes, masks, and engraved gorgets. Many were of pearl-like whiteness and served as ornaments. Thirty-nine specimens of shell; thirty-one specimens of bone and horn.

Copper implements (fig. 61). The North American Indians, at the time of the discovery of the continent, were in the Neolithic period of civilization, and their stone implements were, for the most part, polished. It is commonly believed that they had no knowledge of bronze. Virgin copper was found in divers portions of the United States, chiefly in Lake Superior. The Indians treated it as a malleable stone and hammered it into implements and ornaments. The consensus of opinion is that the Indians could not, at the time of the discovery, smelt or cast metal, though this has been doubted. The Conquistadores saw ornaments and objects of copper in the hands of the natives, and had great disappointment that it was not gold. Mr. Frederick S. Perkins, of Wisconsin, sent to the Exposition at Madrid a collection of prehistoric copper implements and objects, collected principally within the State of Wisconsin. Some were found in mounds or burial places, but others were turned up by the plow. The distribution of copper objects is general throughout the valleys of the Mississippi River and its tributaries, with extensions toward the Atlantic Coast. The common objects are axes, hatchets, hammers, knives, drills, gravers, spear and arrow heads, bracelets, disks, gorgets, tubes, beads, plates. Some have been perforated and others elaborately ornamented with figures made, sometimes by puncture, other times *repoussé*.

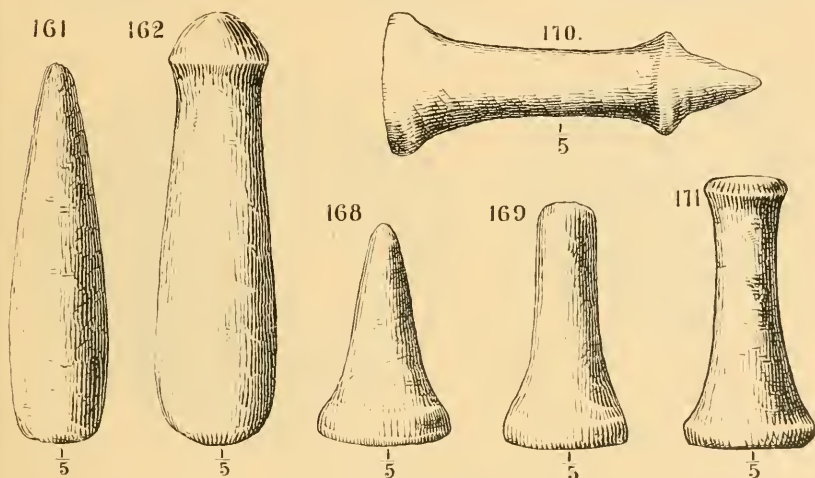


Fig. 46.

PESTLES AND HAMMERS.

161, syenite, Santa Cruz Island, California; 162, sandstone, Dos Pueblos, California; 168, greenstone, Pennsylvania; 169, syenite Ohio; 170, greenstone, British Columbia; 171, greenstone, Washington State.

North American sculptures (fig. 62). The aborigines of the United States were apparently possessed of a great penchant to represent the human face or form in stone. They were made both in hard and in soft rock. The implement which probably did the most service was the hammer, and the operation performed by attrition or pecking. The sculpture was in some specimens afterwards smoothed and polished. Whether these sculptures were used as idols, for decoration or ornament, or as totems, has never been satisfactorily determined. They are distributed throughout the United States east of the Rocky Mountains.

The stone collars of Porto Rico are puzzles to the archaeologist. No suggestion as to their use has proved acceptable. They are thus named because of their resemblance to the modern object of horse furniture. Some are in a rude state, indicating a rude stage of manufacture. The finished specimens are "right and left shouldered," as though to be used in pairs. Nearly all are decorated. The National Museum possesses the largest and finest collection known. Five specimens.

Zémès. Stone objects peculiar to Porto Rico and possibly San Domingo. Found in ancient caves, graves, and in human habitations. They are entirely prehistoric, having been in possession of the natives at the advent of the white man. Their use is unknown, and though various uses have been suggested, none are more satisfactory than that of fetich or spirit. They are of hard, usually volcanic rock, pecked and smoothed in a conical or manniform shape, with a representation, on one or both ends, of a human or other animal. Eleven specimens.

WEST INDIES.

Stone masks, clubs, hatchets. These are generally from the same localities as the stone collars and the zémès, and are believed to have the same antiquity. The hatchets are casts. One is from Tennessee, displayed here for comparison. Twelve specimens.

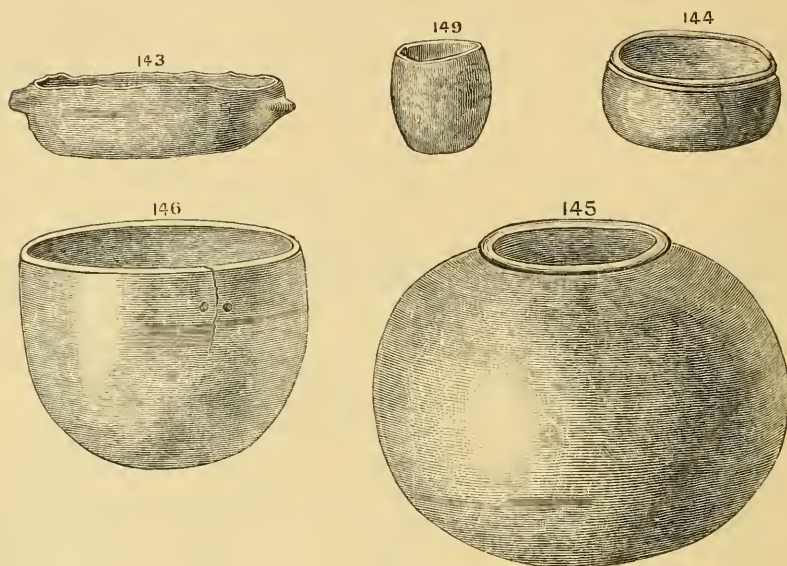


Fig. 47.

STEATITE VESSELS.

143, steatite, Massachusetts; 144, steatite, Wyoming; 145, steatite, Dos Pueblos, California, 146, Dos Pueblos, California

ALASKA, MEXICO, AND CENTRAL AND SOUTH AMERICA.

Jade, turquoise, rock crystal. Jade was a favorite material with prehistoric man, and in some one of the following varieties was made into implements, utensils, or ornaments in nearly every part of the inhabited world. Jadeite was plentiful in Mexico and Central America, while nephrite is indigenous in Alaska. Jade is a generic term including jadeite (silica, alumina, soda), specific gravity 3.3; nephrite (silica, magnesia, lime, and iron oxide), specific gravity 2.9 to 3.1; fibrolite (alumina, silica), specific gravity 3.0 to 3.2; saussurite (silica, alumina, lime), specific gravity 3.2 to 3.3; actinolite (silica, magnesia, lime, protoxide of iron), specific gravity 3.0 to 3.2; pectolite (silica, lime, soda, and water), specific gravity 2.7 to 2.9. Fifty-six specimens.

Obsidian is volcanic glass. Its source of supply was in the Rocky Mountains, where it was in profusion. It was easily worked, took a keen edge, and was much employed by the aborigines. It was worked principally by chipping, though it could be ground and polished. It served for ornaments as well as implements.

Its chief employ was in Mexico and Central America, where have been found many wonderful specimens of sculpture, cores, flakes, and leaf-shaped blades, the latter thin, sharp, and beautifully chipped. An extensive aboriginal commerce was carried on in obsidian. A thousand specimens have lately been exhumed from the Hopewell Mound, Ohio, a thousand miles distant from the nearest known locality where obsidian had its origin.

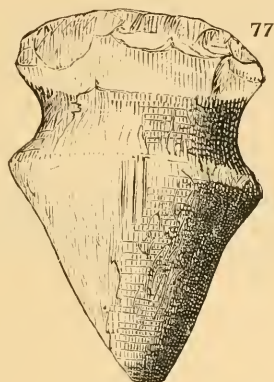


Fig. 48.

STONE PICK FOR STEATITE QUARRYING.

Grayhacker, Pennsylvania.

Chiriqui gold ornaments from Panama. The Chiriqui tribe of aborigines occupied a portion of the Isthmus of Panama between Costa Rica and Veragua. Gold ornaments were discovered in 1859 in prehistoric graves. Gold, silver (in alloy), copper, and possibly tin are represented. Gold-silver alloy is probably a natural compound. Gold-copper alloys appear to range between purity in either metal. Most of the gold objects were made by casting in molds rather than by hammering. Gilding, or at least plating, was practiced. Gold was used for ornaments and not for implements or utensils. Ten specimens from Chiriqui; 6 specimens from Central America; 1 specimen from Mexico.

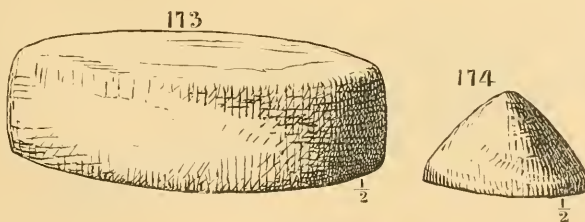


Fig. 49.

MULLERS FOR GRINDING GRAIN AND PAINT.

173, greenstone, Georgia; 174, hematite, Ohio.

Quimbaya gold ornaments from Antioquia, South America. The Quimbaya tribe of aborigines was found by the Conquistadores occupying territory 10 or 15 leagues square west of the Cordilleras and east of the river Cauca, with the rivers Tacumbi on the north and Zegnes on the south. This country was called "El Dorado." The natives were adepts in working metals. The gold was alloyed with copper from 10 up to 50 per cent, and perhaps more. It was wrought by hammering, casting, and possibly by soldering. The gold ornaments are of every

size, from 1,710 grams down to a single gram, and of gold vases $13\frac{1}{2}$ inches high and $9\frac{1}{2}$ wide down to the smallest. The gold objects buried with the Cacique Yamba weighed 30 kilos. Four hundred and fifty-two gold objects from Colombia were displayed by that Government at the Madrid Exposition; 41 specimens from Colombia; and 1 from Peru, exhibited by the U. S. National Museum.

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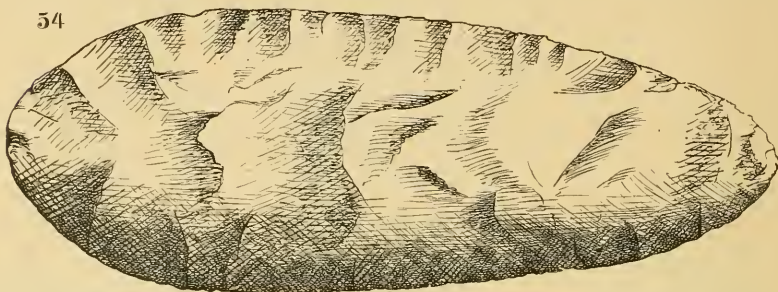


Fig. 50.

DIGGING IMPLEMENT.

Quartzite, Tennessee.

Black argillitic stones similar to that shown, covered with representations in bas-relief of human, animal, and other subjects, are found in that country and have been claimed as amulets and as calendars of the ancient time system. (*Century Magazine*, October, 1891, pp. 885-889.) They were sometimes certainly, and probably always, used for hammering the gold in repoussé to represent the desired object. One specimen.

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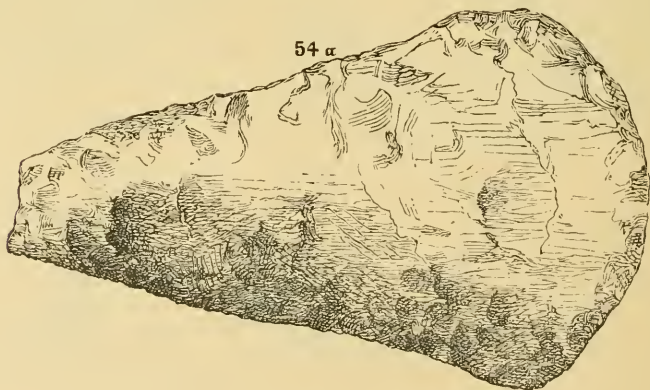


Fig. 51.

DIGGING IMPLEMENT.

Quartzite, Illinois.

MODELS OF PREHISTORIC RUINS IN THE UNITED STATES.

Great Etowah Mound, Georgia. This mound stands upon the north bank of Etowah Creek, near Cartersville. Its base covers a space of about 3 acres, and stands at a level of 23 feet above low water in the river. The body of the mound has an irregular form and is longest on the meridian, its diameter in that

direction being about 270 feet. On the top is a nearly level area of about an acre, the average height of which is about 50 feet above the base. A broad ramp or graded way winds upward from the plain, around the south face of the mound, somewhat more than halfway to the top. There are two smaller mounds close by—one on the south, another on the southeast—each about 100 feet distant, their bases nearly square, and of nearly equal dimensions. Both are truncated. Most of the material of these mounds is the rich mold of the bottom lands, with occasional lumps of red clay. Prior to the clearing of the land, large trees flourished on the top and on the slopes. Scale: 1 inch to 10 feet, 1:120. Area represented, about 3 acres.

Ancient earthworks, Illinois. This model represents one of the most extensive works of the Mound Builders in this country. It is situated in the Mississippi bottom, 15 miles from Anna, in Union County, Ill. The inclosing wall is rudely square in outline and its length exceeds 3,200 feet. It incloses an area of about 28 acres and is from 2 to 4 feet high, with a width of from 20 to 25 feet. The northeast quarter of the inclosure is bounded by the creek and has no inclosing wall. Within the inclosure are found four mounds and a great number of circular depressions, or "hut rings." The largest mound is about 12 feet high, the smaller ones about 100 feet in diameter and 5 to 9 feet high. The circular excavations are nearest the creek, and number over 100. They vary in diameter from 20 to 50 feet, and in depth from 1 to 3 feet. Outside of the bounding wall, on the southwest corner, occurs a large mound, 150 feet in diameter and over 4 feet high. Near it are three large circular depressions 120 to 150 feet in diameter and from 5 to 7 feet deep. Scale: Horizontal, 1 inch to 30 feet, 1:30; vertical, 1 inch to 6 feet, 1:72. Area represented, about 57 acres.

Section of Little Etowah Mound, Georgia. This is one of the smaller mounds of the Etowah group, in Bartow County, Ga. It represents a section of a mound, showing the interior construction—the different layers of earth which compose it, the position of the stone burial cists which were found in it, the position of bones, etc. (See Great Etowah Mound.) Scale: 4 inches to 5 feet, 1:15. Area represented, about 1.10 acre.

Burial pit under a mound in Caldwell County, N. C. The excavation made revealed the fact that the builders of the mound had first dug a circular pit, with perpendicular margin, to the depth of 3 feet, and 38 feet in diameter, then deposited their dead in vaults or graves built of water-worn boulders and clay merely sufficient to hold them in place. Each one of these contained a human skeleton. There were five skeletons in the pit which were uninclosed.

Pueblos of the United States. The Pueblo country, so called, in the United States of North America, lies in Colorado, Utah, New Mexico, and Arizona. It occupies the territory of and between the head waters of the Rio Grande on the east, of the San Juan and its tributaries on the north, the Colorado on the west, and the Gila on the south. This territory is desert in large acres. The pueblos depend for their water on springs as well as on streams. The models of the pueblos of Zuñi, Taos, and Wolpi have been chosen as examples, the former from the river plain, the latter from the mesa, or high table-land. Zuñi is on the Zuñi River, a tributary of the Little Colorado, in the western part of New Mexico, about 40

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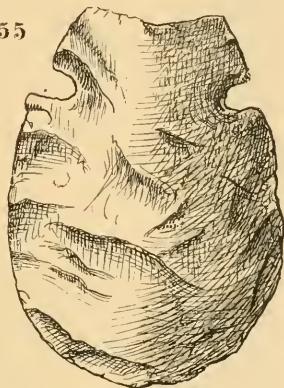


Fig. 52.

DIGGING IMPLEMENT.

Gray flint, Illinois.

miles southwest of Fort Wingate, and belongs to the Indians of that name. Taos is situated on the Taos River, a tributary of the Rio Grande in New Mexico, northward about 200 miles from Santa Fe. It was occupied by Spaniards in the time of the Conquerer and was the scene of a sanguinary contest in the great rebellion of 1690. Wolpi (spelled also Hualpe) lies at the extreme west of the Pueblo country and belongs to the Tusayan Indians called Moquis, a name they do not accept, preferring that of Hopi. Some of the transparent photographs in the windows show views of pueblos and pueblo life.

The first knowledge had by the Europeans of New Mexico and Arizona was about the year 1530, when it was vaguely called the country of the "Seven Cities." In 1540 Vaquez Coronado, governor of New Galicia, organized an army of 300 Spaniards and 800 Indians, and set out for the north to conquer the "Seven Cities of Cibola." It is highly probable that these "Seven Cities" were located in the valley in which Zuñi is now found. At any rate all that country was subjugated and an expedition was sent out to the northwest to conquer other rumored "cities" in that direction. Supposed traces of this expedition in the shape of Spanish mail armor, Spanish

bridles, bits, etc., have been found far north, in Kansas, and even in Minnesota. In the course of this expedition seven villages were subjugated, and priests were left with them to inculcate the religion of the conquerors. This region was called Tusayan.

At a general insurrection of the natives, which took place in 1680, the Spaniards were expelled from Tusayan as from the other pueblos, but while all the others were reconquered within a few years and rechristianized, the power of the Spaniards never was reestablished as far west as Tusayan, and since 1680 there has not been a priest stationed among them. They practice to-day essentially the same rites and ceremonies as their forefathers before the discovery by Columbus, and are therefore of peculiar interest in prehistoric science.



(30190)



Fig. 53.

OBSIDIAN DAGGERS.
Hoopa Valley, California.

Zuñi is the largest and most populous of the existing pueblos, and is supposed to have contained a population of nearly 5,000. There are, in 1880, but 1,602. The houses are built of small stone laid up as a wall with little mud mortar, the interstices chinked and the wall plastered, still with mud mortar. The Spaniards during their 150 years' occupation taught them the art of building with adobe or sun-dried bricks, of which material the old church in Zuñi is constructed

and is still standing, but the improvement was not adopted. The houses are usually well finished inside, are neatly washed with white clay, and are comfortable habitations. The floors are occasionally made of flagging, but are

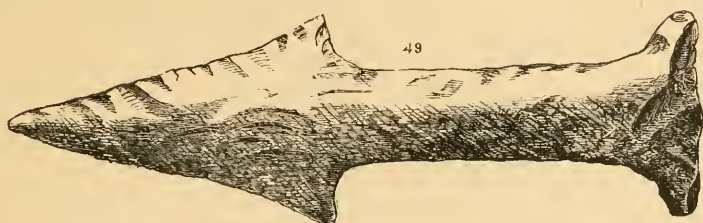


Fig. 54.

CHIPPED STONE DAGGER WITH HANDLE.

Gray flint Mound, Alabama.

usually plastered with clay adobe. It is smooth and readily kept clean. The roofs are constructed of cross rafters, filled in with willow brush. Light is admitted through windows formerly made of plates of mica, for which glass, when obtainable, is now substituted. The houses on the ground are usually

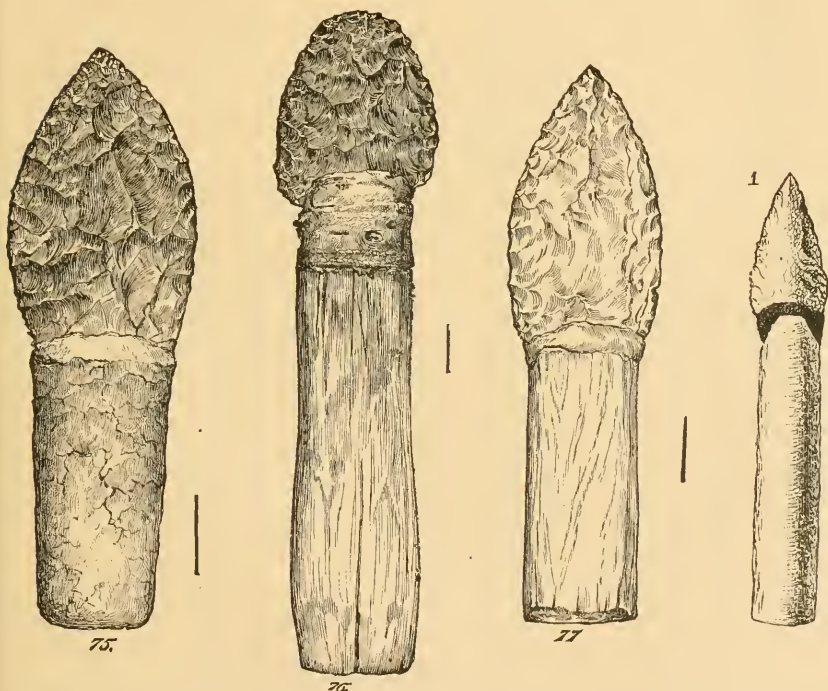


Fig. 55.

STONE KNIVES IN WOODEN HANDLES.

Hoopa Valley, California.

- closed, the entrance being through the upper stories, which are reached only by means of ladders, as shown in the model. The terraces are favorite lounging places for the inhabitants. The oval, dome-shaped structures close to the houses

are adobe ovens, used for baking the sacred or feast bread. In wicker bird-coops are kept eagles, hawks, and turkeys, which are regarded as sacred birds, and from which are plucked the feathers used in the dance and ceremonials. Covered ways permit access to several parts of the town. The streets are not broad enough to permit the passage of wagons, and the transportation is by horses and donkeys.

Wolpi is one of seven contiguous Tusayan villages. These villages are located on the flat tops of tongues or points of the mesas projecting into and overlooking

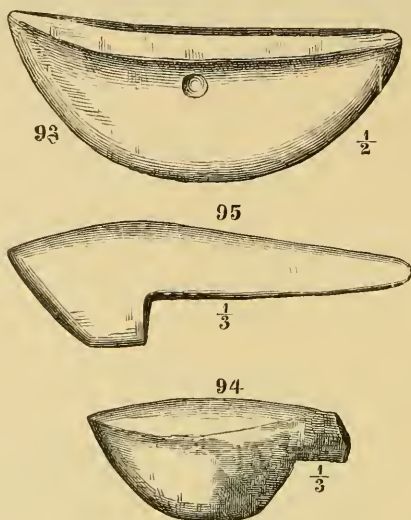


Fig. 56.

SLATE KNIVES.

93, black slate, Pennsylvania; 94, red shale, Pennsylvania; 95, red shale, Indiana.

the valley 400 or 600 feet below. The houses are built in long rows, several stories in height, each story usually set back so as to form a terrace. Their gardens are on the hillside or in the valley below. There is no running stream within 40 miles, and they depend for their scant supply of water on the springs

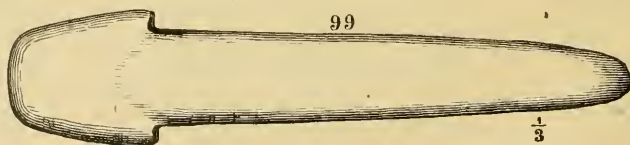


Fig. 57.

SPADE-LIKE IMPLEMENT.

South Carolina.

and wells far down the hills or in the valley. The Tusayans of these pueblos number about 2,000. They are sedentary and peaceful, and live much as do the Zuñis. They may not all have the same origin, for one of the pueblos, Tewa, speaks a different language from the others.

Cliff ruin, "Casa Blanca." This prehistoric ruin, situated in Canyon de Chelly, Arizona, is a combination of village and cliff dwelling; whether originally so is unknown. The lower part contains a large circular chamber 16 feet in diameter,

with about 22 well-defined rooms, and traces of others. Some of the walls are adobe and are very thin. The upper portion of the cliff is situated in a natural cavity in the rock, measuring about 94 feet in length and 40 feet in depth. It consists of 13 rooms and is built out even with the edge. One of the rooms is supported by a well made buttress, a feature rare among these ruins. Traces of walls which once extended three stories up from the ground, almost to the floor

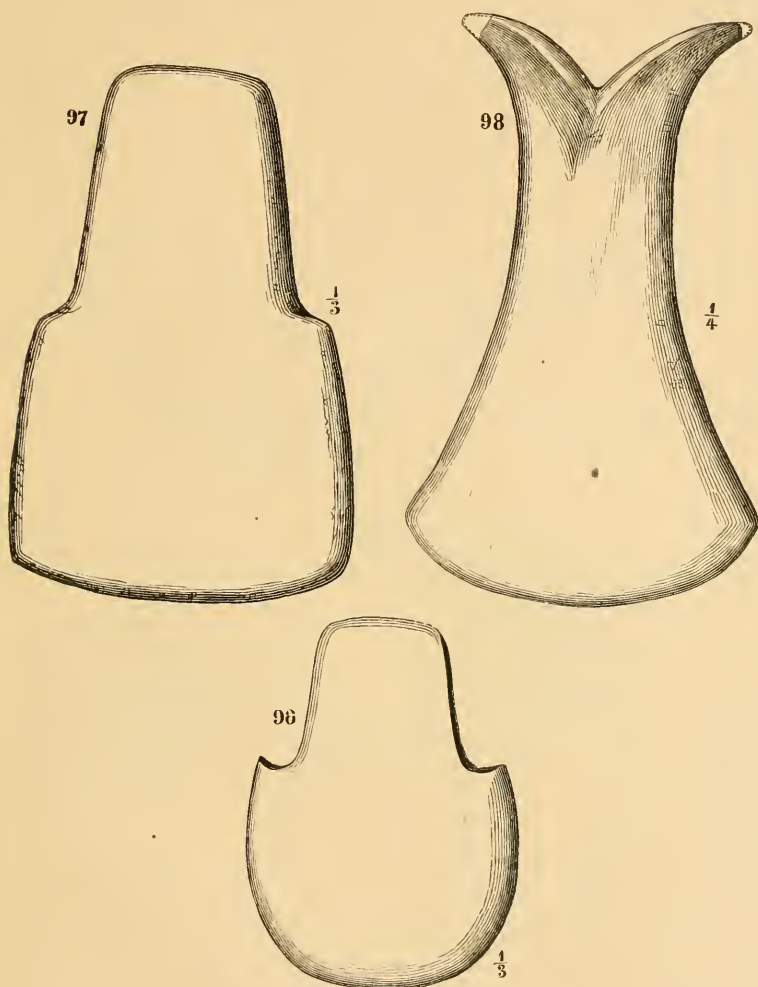


Fig. 58.

SPADE-LIKE IMPLEMENTS.

96, greenstone, Kentucky; 97, Arkansas; 98, South Carolina.

of the upper cavern, can still be seen on the cliff face, and access to the upper portion was had, doubtless, by means of terraced roofs of this part. The overhanging cliff extends upward for nearly a thousand feet above the ruin. The principal room in the upper portion is two stories high and has been coated with a wash of white clay trimmed with yellow; hence the name of Casa Blanca. Scale, 1 inch to 5 feet, 1:60. Area represented, 150 feet high, 210 wide.

Ruined Pueblo of Wejegi, Chaco Canyon. This ruin is on the north side of the Chaco Canyon, New Mexico, close under the cliff, about 9 miles above the junction of the Escavada. The interior dimensions of the ruin are about 170 by 118 feet. It forms three sides of a hollow square, and presents a front of 15 rooms on the longer or 11 rooms on the shorter side. In the north row, some of the walls are still standing to heights of from 12 to 18 feet, and this part of the structure was at least three stories high. The walls are of stone, shaped as shown, and laid up with mud or stone mortar of mud without lime. On the ground plan there are 93 rooms. The north or main row is 5 feet deep; the east and west wings are each 4 rooms deep. The rooms on the ground average about 9 feet square. There are no openings in the outer wall. There are two circular "estufas" 23 feet in diameter, in the corners formed by the intersections of the wings with

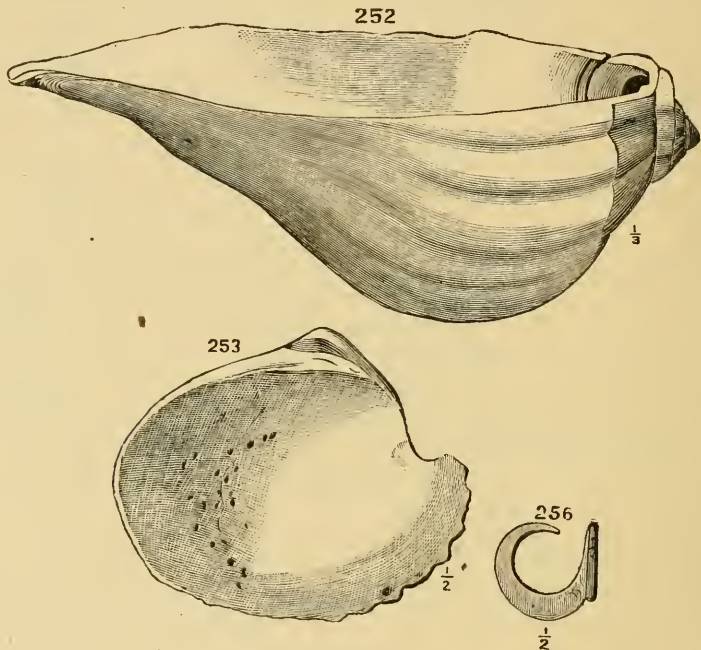


Fig. 59.

SHELL IMPLEMENTS.

252, *Pyrula* shell, Indiana, mound; 253, *Pyrula* shell, Kentucky, mound; 256, *Haliotis* shell, California.

the main row, completely inclosing the building, but there is no standing wall remaining. The building was once terraced from the court outward. It probably contained about 210 rooms, and on the basis of the proportion existing in the present inhabited pueblos, probably had a population of about 300 persons. Scale, 1 inch to 5 feet, 1:60. Area represented, about 1 acre.

Ruined tower, Colorado. This ruin is within a mile of McElmo Creek, a small tributary of the Rio San Juan, in southwestern Colorado. The ruin seems to have been a compact village or community dwelling, consisting of two circular buildings and a great number of rectangular apartments. The greater part of the village is in such a state of decay as to be hardly traceable among the sagebrush and rubbish. The apartments number nearly a hundred and seem generally to have been rectangular. The walls of the tower only are standing, and the only portion represented. It is constructed of roughly hewn stone, and is one of the best specimens of this ancient architecture. Scale, 1 inch to 2 feet, 1:24. Area represented, 64 by 64 feet.

Mummy Cave, Canyon del Muerto, Arizona. This ruin receives its name from a well preserved mummy discovered in a cist near it. It stands on a shelf as repre-

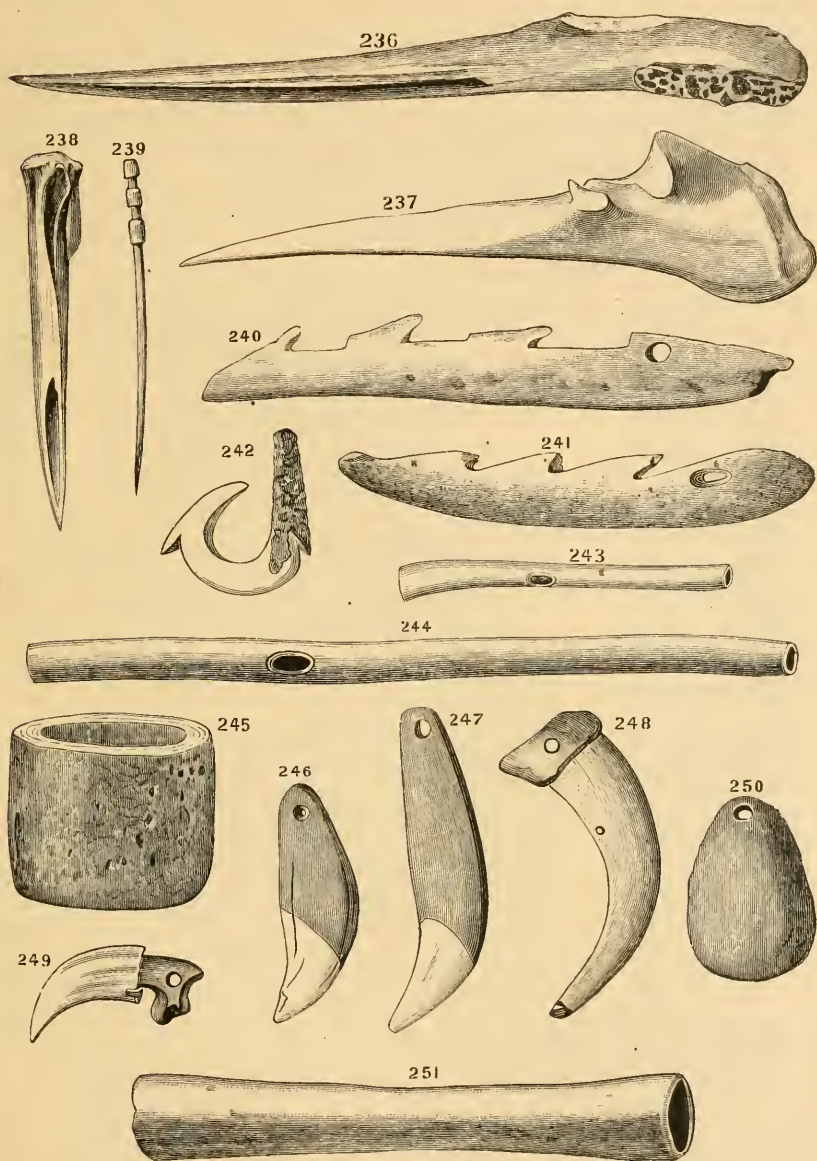


Fig. 60.

HORN AND BONE IMPLEMENTS.

sented by the model, but has been much reduced from its original width by crumbling, and is at a height of 200 feet from the bottom of the cliff. The dwelling occupied two unequal crescent-shaped caverns, and follows the configuration

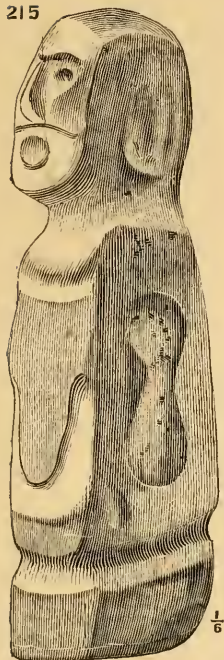
of the rock. At the junction of the crescents on a narrow shelf was a rectangular tower three stories in height, the walls and floors of which were of better mate-



Fig. 61.
COPPER IMPLEMENTS AND ORNAMENTS.
United States.

rial and construction than those on either side. The village contained several constructions which might have been "estufas" (sweat houses or cisterns), or

215



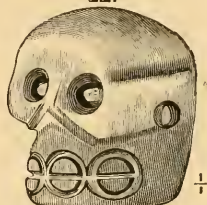
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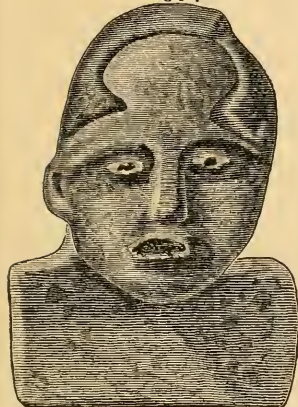
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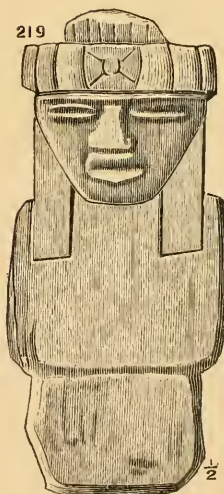
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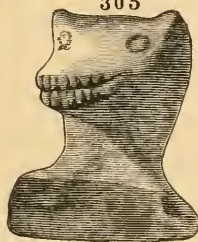
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Fig. 62.

ABORIGINAL, TERRA COTTA AND STONE SCULPTURES.

304, clay figure, Alabama; 305, clay figure (wolf) (?), Alabama; 215, limestone, Tennessee; 216, limestone (human head), Virginia; 217, ferruginous sandstone, Ohio; 218, volcanic rock (human face), Tuxpan, Mexico; 219, greenstone (?), Mexico; 220, alabaster, Mexico; 221, silicified wood, Yucatan.

might have been tanks for holding a supply of water. No means other than is apparent from the situation have been suggested as to how the water was obtained. The walls are of masonry. The stones of which they were made are lying about as when the walls were destroyed. The village might have contained a thousand inhabitants. The cave and cliff dwellings of this country are at all heights in the cliffs, from 30 to 800 feet from the bottom, and the same variation in height from the top of the cliff. These towers and some other monuments are quite prehistoric, and were in the present ruined condition when first visited by the Spaniards, and have never been occupied in historic times nor by any known peoples. Scale, 1 inch equals 5 feet.

BRONZE AGE.

EUROPE.

The Bronze Age is so named because the principal cutting implements were made of bronze. It succeeded the Neolithic or Polished Stone Age in Europe, and preceded the Iron Age; and had a duration of one thousand or two thousand years, and in some places possibly three thousand years. No written history of the Bronze Age has descended to us. Bronze is a composition of copper and tin in the proportion of about 10 to 1, and is harder than either of its components. The supply in Europe during the Bronze Age seems to have come from the Orient. Bronze implements were made by hammering and casting, and the bronze was used many times over by recasting. No less than fifty-seven bronze foundries have been discovered in France, and a proportionate number in Italy, the one at Bologna having 14,000 pieces ready for melting. Bronze casting was extended to include all manner of prehistoric implements, utensils, and ornaments, and continued into protohistoric times, Etruscan, Grecian, Roman, etc., until its use became as at present. Seventy-five specimens of bronze and 1 mold for casting knives and pins.

Bronze hatchets. The people of the Bronze Age in Europe were descendants of those of the Neolithic Age, and their bronze hatchets were at first in the same general form as the polished stone hatchets of their ancestors. Copper hatchets of this form have been found, which has given rise to a belief in a Copper Age preceding Bronze. Bronze hatchets passed through several stages of evolution, though the steps are not always certain. The first bronze or copper hatchets were hammered straight and flat, though sometimes with projecting wings and stops on the edges; second, hatchets cast in molds and with wings and stops; third, the wings were increased in size and hammered over to clamp the handle; fourth, the socket. Stops and rings appeared in some of the styles. Five specimens.

Bronze hatchet, first style. Plain, straight, the edges thickened by hammering to give strength after the fashion of a T-beam of the present day (fig. 63). Two specimens in this tray are of copper. These are rare. Many of the bronze hatchets of this epoch, and all the copper ones, were made by hammering, but casting was soon introduced and became universal. They were inserted in a long handle of wood, and doubtless served both as implements and weapons. These are called in France hatchets a bords droits. Reproductions of molds for casting are in adjacent trays.

Bronze hatchets, second style. These are always cast and always handled. They appear to have been an evolution from the first style. The handle, still of wood, was either naturally or artificially bent at the poll; was split and inserted. The stop at the bottom prevented further splitting, while the ring on the inner side afforded means of lashing to the handle (fig. 64). They are called in France a talons. Reproductions of molds for casting them are in adjacent trays.

Bronze hatchets, third style. These are likewise always cast and always handled. The handle was bent, split, and the hatchet inserted as in the preceding epoch. The wings were cast straight, and, on insertion of the handle, were closed over it on each side and hammered down, thus holding the handle firmly (fig. 65). No. 25243 shows a piece of the original wood thus inserted. Reproductions of molds for casting them are in adjacent trays.

Bronze hatchets, fourth style. Always cast and always handled. During this epoch of the Bronze Age this form was the ne plus ultra of bronze hatchets. They were the hardest, best composition, and held their edge the best. They were most effective whether as implements or as weapons. The handle was inserted in the socket, and, as usual, bent at the poll and lashed with a ring. The square forms were peculiar to Brittany, where they have been found en cache (fig. 66). (M. de Mortillet found a cache of 100 at Moussaye, and M. de Chatelier one of 92 near Pont l'Abbe.) They were occasionally deteriorated in quality and size, and were placed in the graves as votive offerings to the dead. Representations of molds for casting are in adjacent trays.

Bronze spearheads. These are all cast. Their use continued into the Iron Age, and even into historic times. The Etruscans and Romans used them as well as did their predecessors.

Bronze swords, poniards, daggers.

These continued in use until a late period. They spread over Europe and are traceable by their different styles. Nos. 101584-101586 are from Sweden; 101121 from Brittany, yet this form of grip is often found in Italy. No. 101342 belongs to the Iron Age, and shows the scabbard and the netting in which it was held. The three complete specimens are casts—originals at Königsberg, Prussia. Nos. 101584, 101585 are Swedish; 101125 is from Brittany; they are from a foundry

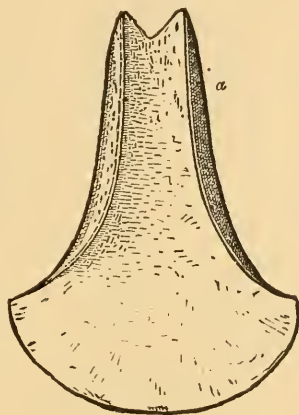


Fig. 63.

BRONZE HATCHETS.

Europe

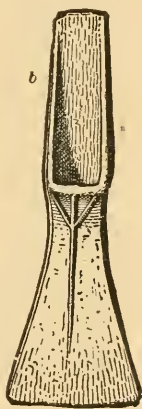


Fig. 64.

of the Bronze Age, and have been broken into bits to be melted and recast.

Bronze sickles. These were cast in molds of stone or bronze, possibly of sand or clay. One of these molds is in the adjoining tray. The implement was attached to a wooden handle elaborately carved to fit the hand. (See No. 139765, right-hand side of this tray, for example, found by Dr. Gross at the Station of Moeringen, Lake of Biene, Switzerland; a cast, the original of which is in the Government Museum at Berne.) The sickles were lashed firmly to the handle, were provided sometimes with holes, sometimes with rainures, and sometimes with button-like protuberances, which, when the implement was fitted to the handle, served to fasten it firmly.

Bronze knives. These are principally from the Swiss lakes. The small labels indicate stations in Lake Neuchatel. They were usually cast and usually hardened by cold hammering. A pair of molds are in the adjoining tray. Notice the elegance of form and decoration, superior even to those of modern times.

Bronze razors. This utensil appeared in use in the Larnaudian epoch. The large crescent-shaped were continued into the later, possibly the Iron Age. They were cast and then hardened by cold hammering. Despite their appearance, they could be held in the hand with as much firmness as the modern razor.

Bronze hairpins. At the station of the Bronze Age at Wallishofen, Lake Zurich, were found, in 1884, about 2,000 such pins. Some were 16 inches in length with a head as large as a walnut. They were decorated with concentric circles and not infrequently colored stones more or less precious were inserted.

Bronze fibule (safety pins). These were used during the Bronze Age, continuing throughout the Grecian, Etruscan, and Roman civilizations, to be used as pins for fastening their garments. They are usually found on opening the ancient graves of the latter peoples about the shoulders and breast.

Bronze center base of shield (Roman clipeus). Remark the decoration by incised lines in concentric circles. Similar objects have been found with holes on one side near the edge, supposed to have been for suspension. The shield of the Romans (and so also believed of the Etruscans) was of immense size, made sometimes of leather or hide, and covered with buttons with protruding points for spikes. No. 101812 is one of these spikes.

Bronze strigile. This instrument was used in the bath and by athletes for scraping the skin. The hollow or spoonbill held the oil poured into it from the little

flagon, and with it the skin was anointed. Notice some with closed handles for closed rings. No. 101402 bears the private mark of the maker or owner.



Fig. 65.

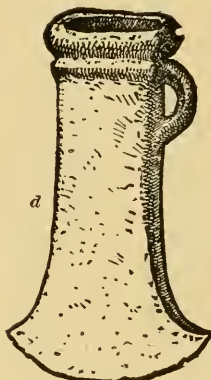


Fig. 66.

BRONZE HATCHETS.

Europe.

Bronze belt of a warrior (fragment). Found in a tomb near Vulci. Only one end or front part has been preserved; the center has decayed by contact with the earth under the back of the extended corpse. The holes near the edges secured a binding, possibly of leather or cloth. Notice the small nails for this purpose. The point is split and spread each way over the binding. Here is the original of the modern McGill patent split spike or paper fastener, specimens of which lie by its side.

Steatitemolds for bronze hatchets (cast).

Each side thereof has been utilized for a similar purpose. Found in Cis-

ternes-la-Forêt, Puy-de-Dôme, by M. Brouillet. Original in Musée Clermont-Ferrand.

Bronze molds for bronze hatchets. A pair of molds complete for casting winged hatchets. The wings were made straight, to be hammered over the split handle and fasten it firmly. The ring for lashing the handle, the orifice to receive the molten metal, and the vents for escape of air are plainly to be seen. Part of the treasure of Vandrevanges, near Sarrelouis, Alsace. Gathered by Victor Simon. Original at Musée Saint Germain, Paris. No. 8102.

Bronze molds for socketed bronze hatchets. Cast of a mold, in two pieces, for socketed bronze hatchets, fourth style. The ring on the side is plainly shown; the core is absent. Found at Briquebec, Seine-Inferieure, France.

Terra-cotta mold for bronze hammers. With core complete, for socketed hammers. From the station of Moeringen, Lake Biene, Switzerland. Gathered by Dr. Gross. Original in Government Museum, Berne, Switzerland.

Mold for a bronze knife, with a socket. Cast of a mold, with core, for bronze knives, with a socket for the insertion of the handle instead of a tang. Complete in three pieces. Found by Dr. Gross, Lake Neufchatel. Original in Government Museum, Berne, Switzerland.

ABORIGINAL MODES OF HAFTING STONE IMPLEMENTS. UNITED STATES.

Various North American tribes still use, though to a limited extent, weapons and tools of stone and bone, hafting them according to the methods in vogue among their forefathers. Such modern specimens illustrate the manner in which the stone axes, celts, adzes, and other implements of earlier date were rendered serviceable by the addition of handles, and are here shown for purposes of comparison:

FIG. 323. Grooved greenstone ax, with a hickory withe bent around the groove. The ends of the withe, which form the handle, are firmly bound with strips of rawhide below the stone head, near the middle, and at the lower part. From the Dakota Indians.

FIG. 324. Polished stone hatchets of argillite, chipped thin at the poll, to fit into the cleft end of an oaken stick, where it is secured by twisted cords of sinew. From the Indians of the Missouri Valley.

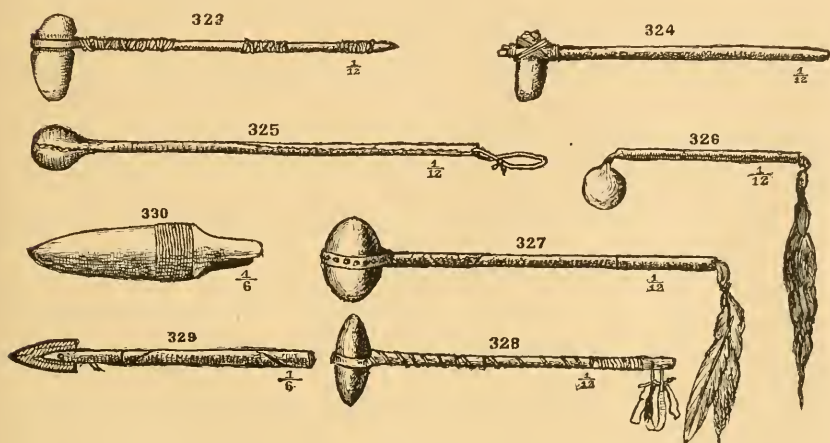


Fig. 67.

ABORIGINAL METHODS OF HAFTING STONE IMPLEMENTS.

FIG. 325. War club, consisting of a solidly round stone, attached to a long handle with rawhide sewed with sinew, and a looped thong in the end for the wrist. From the Dakota Indians.

FIG. 326. A weapon of similar character. In this instance, however, the handle is much shorter and the round stone head is not firmly attached by flexible thongs. The rawhide covering of the weapon (including the head and handle), consists of one piece taken from the caudal portion of an ox, a part of whose tail forms an ornamental appendage to the handle. From the Apaches.

FIG. 327.—A war club with a well-wrought and polished egg-shaped head of yellowish limestone, and strengthened by a casing of rawhide, which extends about 6 inches below the head. The part of the ashen handle that encircles the stone is ornamented with large-headed brass nails. The extremity of the handle, again, is enveloped by a tightly fitting covering of rawhide, taken from the caudal part of the buffalo. A tuft of the animal's tail has been retained for decoration, and a feather of the wild turkey is attached to the hair by a narrow strip of dressed skin. From the Blackfeet.

FIG. 328.—A weapon of the same description. The polished head is smaller and more elongated than in the original of fig. 327. The handle shows the usual casing of rawhide, and is looped for a wrist strap. From the Mississippi River Valley.

FIG. 329.—Dagger knife, chiefly used as a hunting weapon. It consists of a ground lancehead-shaped blade of dark slate, inserted and riveted by means of a wooden peg into a barbed ivory socket, which is attached to a short cylindrical handle of pine wood. From the natives of Nunivak Island, Alaska.

FIG. 330.—Scabbard of the dagger knife just described. Formed by two hollowed pieces of pine, which are held together by a binding of split spruce roots.





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